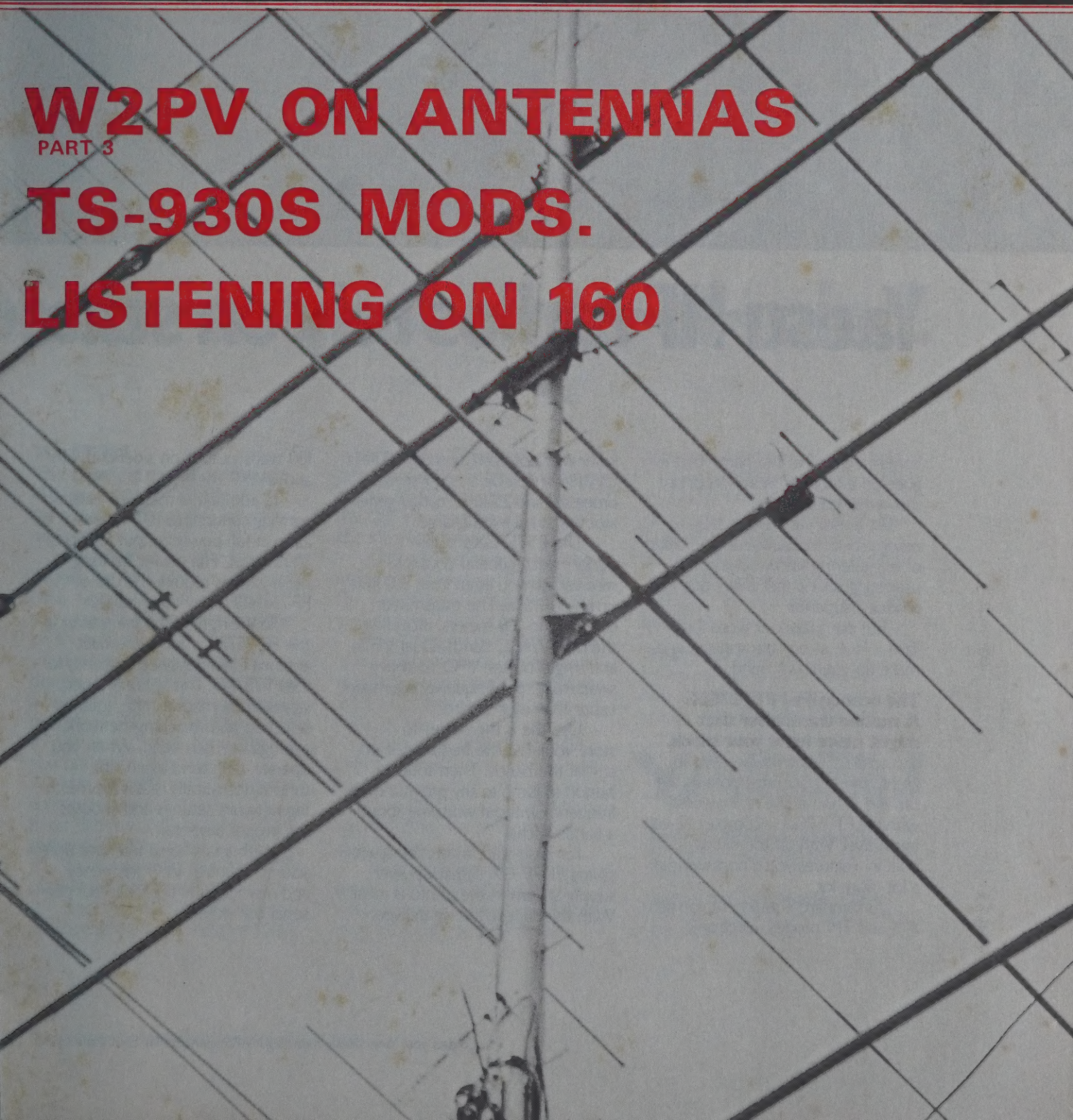
INTN'L MONTHLY MAGAZINE - BY AND FOR ACTIVE RADIOAMATEURS

RADIOSPORTING

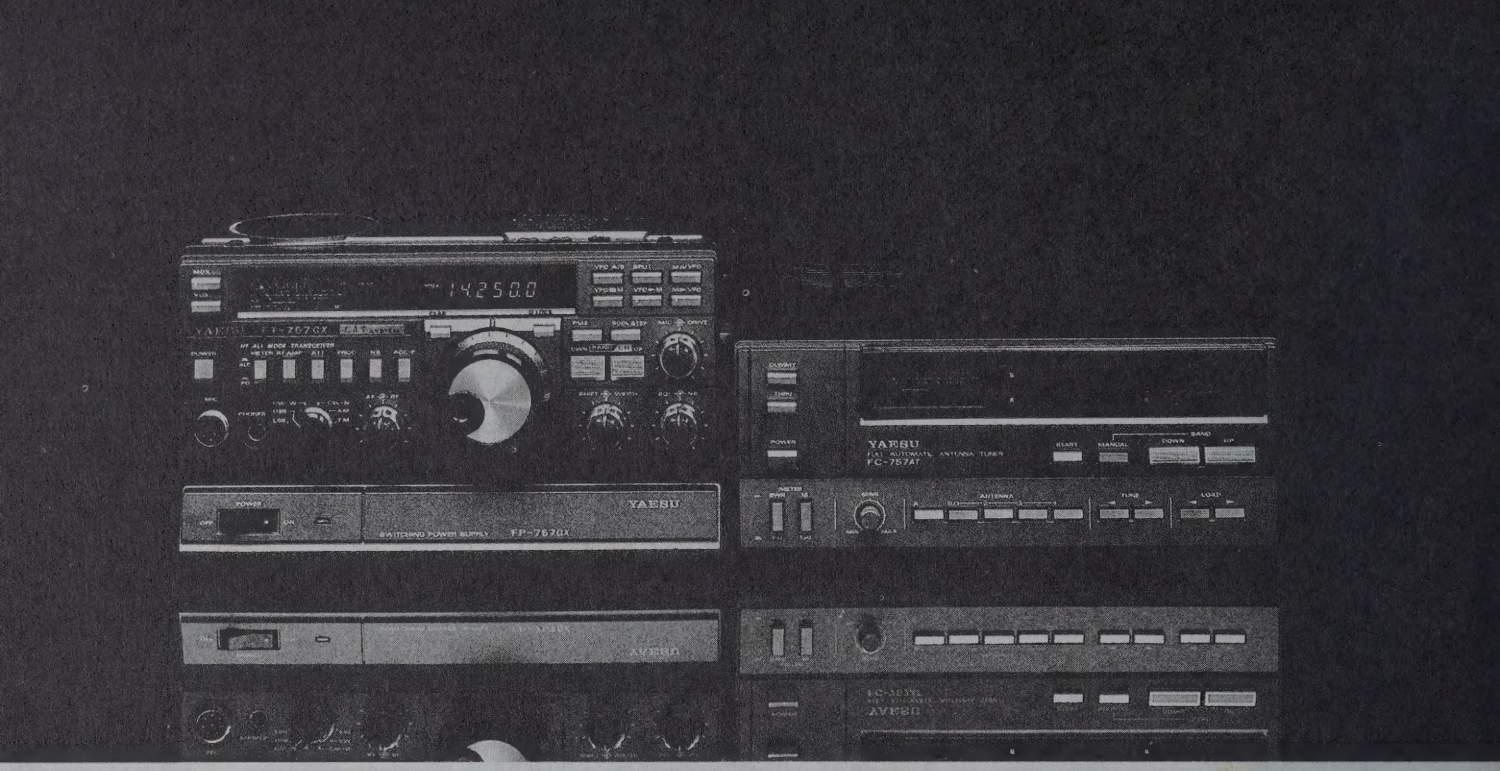
FEBRUARY 1985 No. 4 $2.00



W2PV ON ANTENNAS
PART 3

TS-930S MODS.

LISTENING ON 160



Yaesu HF radios rely on state-

Some people feel the name that goes on a radio is more important than what goes into it.

At Yaesu, we let our technology speak for itself: a unique blend of engineering know-how and user suggestions that make our HF products superior.

But don't take our word for it. Take a look at our transceivers and make up your own mind.

The economical FT-757GX. A mobile transceiver that might never leave your shack.

You told us what you wanted in an HF rig that operates both in the car and at home. We've answered with the FT-757GX: a compact 12-volt transceiver with all the extras built in. Features you'd normally pay a lot more for.

As standard equipment you get AM and FM modes, electronic keyer with dot-dash memory, 600-Hz CW filter, noise blanker, AF speech processor and 25-kHz marker generator. All at no extra charge.

The FT-757GX's high-performance general coverage receiver lets you listen from 500 kHz up to 30 MHz. The transmitter covers 10 to 160 meters, including the new WARC bands. Dual VFOs and single-button VFO/memory swap make split-frequency operation easier than ever before.

Use the 8 memories to store your favorite frequencies on any of the bands. Then touch a button to jump to any programmed frequency without worrying about a bandswitch.

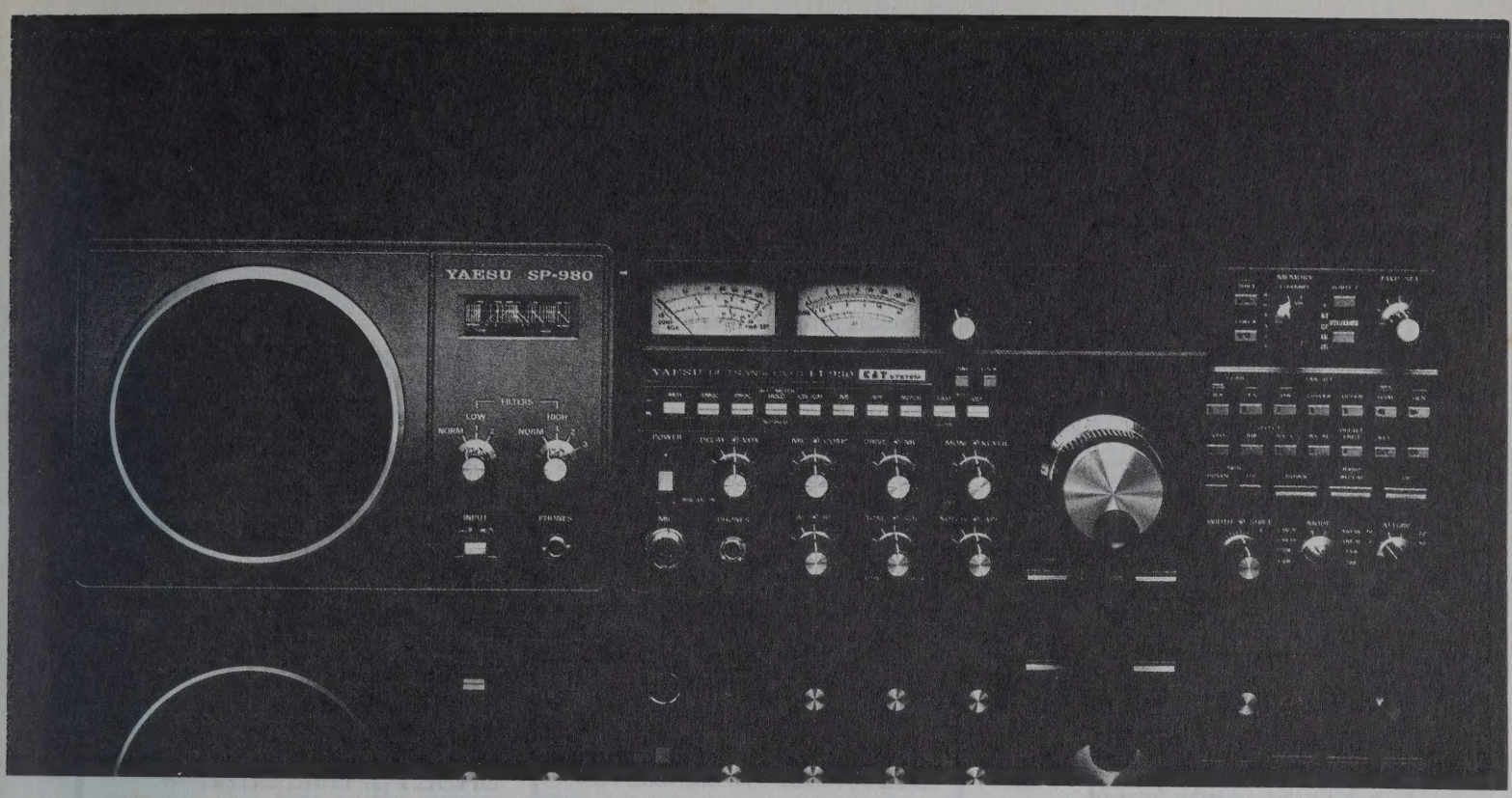
For base-station use, the space-saving FP-757GX flatpack power supply shown in the photo is ideal. With this supply, the rig delivers 100 watts output on sideband, FM and CW.

In addition, a massive heatsink permits continuous RTTY operation at full power output for up to 30 minutes. Full power for long periods does require the use of the FP-757HD heavy-duty supply.

To the right of the transceiver is the FC-757AT, a fully-automatic antenna tuner designed especially for the FT-757GX. This optional tuner stores in its memory the antenna selection and matching network settings for each band. When you operate that band again, the tuner automatically recalls the matching network settings and chooses the proper antenna.

With an optional interface unit, you can control VFO frequency and memory functions via your personal computer.

Contact your Yaesu dealer regarding MARS operation for both transceivers.



of-the-art, not state-of-mind.

The FT-980.
The cleanest signal on the air.
We know that the quality of the signal you put out is a reflection on you.

So when we designed the FT-980, we took clean output seriously. So seriously in fact, that you won't find a cleaner transmitter on the market.

Featuring a conservatively designed final amplifier that loafs at a fraction of its rated power output, the FT-980 cuts distortion levels to new lows. So you get a signal you can really be proud of.

We designed the FT-980 with complete operating flexibility in mind. But not at the expense of fundamental performance.

You can set and forget about 50% of the front panel controls.

Store your favorite frequencies and operating mode independently in each of the 12 memory channels. Review the contents of any memory location, without disturbing the QSO in progress, by using the checking function.

Going from one programmed frequency to another is simple and fast. Just touch a button to recall any channel.

You'll find the FT-980 tolerant of imperfect antennas. There's essentially no power turn-down with an SWR of 2:1 and just 25% turn-down at 3:1.

There's lots of flexibility built into the triple-conversion receiver. For one thing, there are separate front ends for ham and general coverage reception. So ham band operation is not compromised.

Multiple levels of IF filtering assure outstanding rejection of unwanted signals close to your operating frequency. And armchair copy under really brutal conditions.

The FT-980 comes ready to hook up to your personal computer. You can control operating mode, IF passband, frequency, and memory functions from a remote location. A variety of computer interfaces are available. See your Yaesu dealer for details.

State your mind.
When you visit your dealer, tell him you want the latest in HF technology. A radio built by Yaesu.

YAESU

Yaesu Electronics Corporation
6851 Walthall Way, Paramount, CA 90723
(213) 633-4007

Yaesu Cincinnati Service Center
9070 Gold Park Drive, Hamilton, OH 45011
(513) 874-3100.

Prices and specifications subject to change without notice.

DATONG ELECTRONICS LIMITED

Model SRB2

- Finest Woodpecker Blanker Available
- Auto-Trak For Hands Off Operation
- Eliminates 2 Woodpeckers At Once

SASE For Data Sheet

DATONG TEST LISTEN!

The only way to know if a product is as good as they say is to try it personally.
Now AllComm would like you to do just that. We want to send you a C-60 cassette with a demonstration of the DATONG products so you can hear for yourself.
We are so sure you'll like what you hear we'll give you a certificate good for $5.00 off the price of the SRB 2 & FL 3 or $2.00 off any other DATONG product that we offer.

Just send $1 for postage & handling ($1.50 or 7 IRC's for overseas) to:

Model FL3

- Multi-Mode Audio Filter With Auto-Notch
- 4 Complete Filters
- Special Tuning For RTTY & CW

SASE For Data Sheet

AllComm

5717 NE 56TH
SEATTLE, WASHINGTON 98105
(206) 641-7461

YES! Count me in! I want to support RADIOSPORTING __ IRSA __.
Save 1/3 or more and get fast home delivery.
Start with #1 issue (NOV. 84) __ or _____ 19___ issue.

SUBSCRIPTION FORM:

NAME:_____

CALL:_____ EX:_____

ADDRESS:_____

CITY:_____

STATE:_____ CODE:_____

COUNTRY:_____

RADIOSPORTING Magazine SUBSCRIPTION

1 YEAR $16

2 YEARS $30

IRSA MEMBERSHIP NEW $12

IRSA RENEWAL $ 5

Outside of USA/Canada please add $ 3/year

Total amount of $_____ in US funds enclosed by check drawn on US bank or money order, payable to IRSA - Radiosporting. (Or equivalent in Canadian funds.)

If you would like to participate in IRSA activities or contribute material and articles to RADIOSPORTING, please let us know.

Please mail to: RADIOSPORTING, Box 65, Don Mills, ON, M3C 2R6 Canada

WE3BMV Radiotorial

We are still up to our ears with the workload, mainly doing typing and other "fun" things associated with the production of RADIOSPORTING. Things are getting better though. Instead of working 20 hours a day, we are down to 18. More computer power is coming on board. We know that a number of typos and errors are still getting through. They are usually spotted the day after the material has gone to the printer. When you take a day's break, then you see them. We are now using the SpelStar program to do last minute checking for spelling errors and typos. Even after proofreading, we manage to make some goofs while fixing other errors. We hope that content is more important than the occasional goof.

We thank you for all the comments and suggestions and we are doing our best to make the magazine better and better.

Many were probably curious about the cover of our January issue. The people were Larry, VE3LLW, and Doug, VE3MV, installing 7 el. VE3BMV Log Razor Beam for six meters atop of VE3CVX's 90 footer.

We are seeing a resurgence of concern about amateur radio growth. The ARRL is setting a goal of 600,000 amateurs in the US by 1990. This is a nice objective, but I wonder if "numbers" is the right thing to focus on. My personal feeling is that it is better to have quality rather than quality. Looking a bit deeper, there are a few concerns that we should keep in mind.

Why do some people let their licenses expire? Why do they lose interest? When you listen to some pile-ups on DXpeditions and hear some of the animal behavior, you can't blame them. Foul language and inconsiderate operating can turn away many, especially younger, hams.

Why are our youngsters not crazy about ham radio? The old magic of talking to someone across the ocean is perhaps not magic to them, as it was to us. They see pictures from around the world on TV every day, and they get better weather reports through satellites than from hams. They are more fascinated with computers. Ham radio is not exactly on the front pages of the press or TV programs. We lack publicity. The "glamor" is not there. Kids like exploration, discovery. While there is still enough to be discovered in communications technology, computers are the thing right now. One can get more benefit out of being computer literate than being radio literate. I think the next stage is going to be a marriage of communications and computer technology (it's actually happening already). If we consider the possibility of remote controlled gizmos wandering around, we have a perfect example of computer and communications electronics tied together with mechanical actuators and sensors, giving us all kinds of interesting possibilities. Automation and robotics are making inroads into manufacturing and this is where skills are required to design and apply computer and communications technology. Amateur radio is a natural and excellent complement of automation and computer technology. It also opens up all kinds of possibilities for enterprising individuals. You can put together a little factory in your garage and make printed circuit boards or whatever.

As you can see from the description of IRSA objectives, we are dedicated to quality. We believe that if we improve the quality of operating on amateur bands, the good news will propagate and we will attract new and young people. We want to promote amateur radio and its sport oriented activities. Those involved in contesting, DXing or other -ing usually last longer than any others. We think that at this time, the competitive aspect of radio is more attractive to youngsters than just chewing the rag. I know myself that if I had not been bitten by the contest bug, I would have been a "dead" ragchewer or even DXer quite some time ago. Many people get bored with doing the same thing over and over again. Contesting is a perfect attraction. The variables in contesting change all the time. Contesting has kept me active for 27 years now without a break!

What can we do? First, let's set an example by behaving like gentlemen. Belonging to IRSA means that we accept this responsibility and that we are the ambassadors of goodwill and understanding among amateurs and nations.

When you go on a DXpedition, be sensitive to local situations. Meet local hams, give a talk to a local school, give a presentation on amateur radio and help local hams in any way you can. We can train or show them how to become good operators, how to work the world on their own, without lists, etc. Help them to set up their station. Tell or show them how to do things better. Leave some seedlings behind you. What could be more gratifying than knowing that you introduced the future Rajiv Gandhi to amateur radio?

IRSA and RADIOSPORTING want to help to bring new blood into amateur radio. We would like to publicize good things about our hobby, to provide education and a mirror of what is happening, and to let people know how and what the champions are doing. Good examples attract. Please let us know what you are doing in this direction and share your experiences with others. Let's grow in numbers and quality!

73, Yuri

OUR APOLOGY

In the December and January issues of RADIOSPORTING, we had a cartoon which some readers might have considered in bad taste. We apologise if we offended VE3HGN, the author of "Just a thought", or any of our readers. The "idea" was sparked by the expression "Ol' potty self" and the image of the infamous "Greek Thinker." Our judgement was clouded by a hectic schedule and workload. Also, we apologise for some of the language used in "Just a thought..."

We will try to avoid similar situations in the future.

Editor

DX NEWS

The DX news from around the world as exchanged on the IRSA net and other sources: South California DX Bulletin, The DX Bulletin, Westlink Report, WIA, FT8XB, PT7WA, VE3BMV, W6SZN. The IRSA net operates on Sundays around 14.200 MHz, starting at 2000 Z and 3.830 (Mondays at 0200 Z).

3B8CF/3B6, Agalega & St.Brandon
to be active for about 10 days in the beginning of February, mostly on CW.

3Y4CG, Bouvet
operation possibly starting on Feb. 26, with LA4CG now in that area aboard a Norwegian Antarctic Survey ship. He has been in daily contact with LA3CC back home, who also works for the Norwegian Polar Research Institute. This apparently has no connection with the LA5UF/LA1EE group that is also trying to operate from Bouvet. They have the necessary permission to operate from 3Y, but they are having a hard time finding suitable transportation.

4K1GAG, South Shetland
is the Soviet station which is showing up on many bands. 40 m signals are especially loud. QSL via Box 88, Moscow, USSR

4U1VIC, UN Vienna
is still up in the air as far as recognition for the DXCC country status. It has been accepted for WAE and it counts as a multiplier in the CQ WW contest. The ARRL DXAC is still thinking about whether or not to recommend 4U1VIC at the Vienna International Center for DXCC. K3TG will be there to operate some CW. (Hey DXAC guys: what about the separation by "foreign" land?)

5N8ALH, Nigeria
operator Aboud, from Kano, is active on 20 m with IC 751 and 4 el. triband beam. He is getting ready to operate on 80 m this season and should be active in the contests.

5X5GK, Uganda
now has written permission and his cards are "acceptable" by the ARRL DXCC desk. Gerry often uses battery power and that's the reason for his occasional dissapearence. 5X5WR will also be on shortly.

A22ME, Botswana
hanging around 14.181 at 1930 Z with his XYL A22TE. QSL cards via K1VSK.

A61AA, United Arab Emirates
is Ahmed Siddiq S., ex A6ASS, and Des Shepperd, G3LQP, were both operating this station with permission from A61AA. G3LQP is still in England and is not sure if he will return to UAE.

AX9PB, Antarctica
is on the air from Project Blizzard, which is restoring "Mawson's Hut" on a small promontory in Commonwealth Bay. Skeds with VK6NE on 7.080 at 1200 Z.

C9ØA, Mozambique
Chuck Martin, AB4Y, operates from the US embassy in Maputo. Another operator, SMØDQE/C9, uses the same station. They have high hopes in receiving written permission within weeks. Currently they operate with permission from the embassy officials. Apparently, they are tired of waiting for official permission from the "native" government. Chuck's wife requested C9ØYL, but has not been heard from yet. Chuck is supposed to be there for about a year. He is operating mostly on 20 m, hanging around list "undertakers".

CE9AP, South Shetland
can be found on 14.260 at 2345 Z operating from Greenwich Island. Send QSL cards to Ricardo Vasques, Division Antarctica, Correo Naval, Punta Arenas, Chile.

EP2MMK, Iran
reported to be worked by Europeans on 15 m. Looks like Ayatolla did not execute all the "spies" yet.

FH4AA, Mayotte
has been worked quite often on 40 m CW.

Comoros
are now independent of France and will be getting a US embassy in the summer.

FOØXX, Clipperton 1985
Dxpedition is ready to go. Operators W6SZN, W6OAT, W6RGG, N6GJ, KK6X, N7NG, K3NA, WA7NIN, F6GXB, DJ9ZB, TI2CF, XE1ZZA, JG3LZG, FO8HL and FO8GW will be departing from California at the end of March, with plans to arrive on Clipperton by April 3, for a 7 day stay. Transportation to the island will be on a 115 foot sport fishing boat the "Royal Polaris," whose crew has made the trek before. The group plans to have at least 3 stations on the air for 24 hours a day, operating SSB, CW and possibly RTTY. In addition, and if needed gear can be obtained, they may also operate via OSCAR 10 and on the 6 meter band. The cost of putting Clipperton '85 together is approaching $3,500 per operator. Contributions to help defray this expense are welcome. If you decide to help, make your check payable to the Northern California DX Foundation. Send to: Rusty Epps, W6OAT, 948-H Kiely Blvd., Santa Clara, CA 95051. All QSL cards for this expedition will be handled by the YASME Foundation, Box 2025, Castro Valley, CA 94546. An SASE or SAE with postage is required for a direct QSL. All others will go via the bureau.

FT8XB, Kerguellen
is operational now on all bands and will be there for about a year. He is showing up around 14.190 and keeping skeds with HKØHEU on 14.180 at 1900 Z. He had excellent signals on 40 m on the east coast. Equipment used is FT 757GX with linear, 3 el. 20m beam and dipoles. Equipment for OSCAR is 21 el. Yagi and 60W. Moonbounce rig is 4x20 el. and kW, starting in April. QSL only direct to FT8XB, Box 83, 95101 Argenteuil Cedex, France.

J28EB, Djibouti
Gerard is active on 40 m, worked on SSB 7.052 at 2350 Z. QSL direct to Box 2417, Djibouti.

J3, Grenada
Need YL contact from J3? Look for Naralon, VE3LRU/J3, between Feb. 23 and March 3. QSL to home call.

J5WAD, Guinea-Bissau
Vladimir, UB5WAD, was found "sitting" on frequency with A22ME without working anyone, while "undertaker" was having a ball. 14.181 at 1940 Z.

J87, St. Vincent
The annual spring contest expedition by ILL-WIND Contesters and Southeastern DX Club will be held on Feb. 20 through March 5th on all bands. Look for them during CQ 160 m Phone and ARRL DX Contests. QSLs as announced or match the J87 suffix to the stateside suffix and QSL to the Call Book address. A large number of 160 and 80 m operation by: K4UEE, K9GL, WB9TIY and others.

JW6VDA, Svalbard
Tom is active also on 40 m SSB, using dipole and 150 W. He was worked on the east coast with good signals on 7.052 at 2340 Z.

KP1, Navassa
This group operation led by 6Y5NR is supposed to start about April 7. Several US hams are helping in collecting the equipment. They are planning to operate also on "specialty" modes, like 6 m, novice bands, etc.

KP5, Desecheo
Expedition preparation is underway by the Texas DX Society for Mar 7-12. They will be joined by a group of KP4 operators. There will be: K5LZO/KP5 (CW), NR5M/KP5 (SSB), KA5SBS/KP5 (VHF), N5JJ, KC5M, KZ5M, KD5SP, NP4Z, NP4KA, and WP4ATF.

PA6FLD, Netherlands
The Dutch Department of Post has granted the special callsign to Radio Netherlands. It is to be used the weekend of Feb. 16-17, 1985 for a special amateur band operation. They will be using the nation's newly constructed antenna site at Flevoland. Amateurs employed by Radio Netherlands will be on the air using normal amateur transceivers. They will be feeding the gigantic Flevo antenna system for a 36 hours continuous period from 0600 Z on Feb. 16 through 1800 Z on 17th. A special QSL card depicting the transmitter site will be available.

PYØTE, Trinidade
is leaving the island by the beginning of February. QSL cards via PT7WA. PY1BVY will operate mostly on CW while the supply ship will be picking up the crew from Trindade. He should operate about 48 hours most likely using PYØTB call. He was previously PYØFE from Fernando de Noronha. QSL cards to his home call.

RZ1OWA, Franz Josef Land
Wadik was found calling CQ with no takers on 14.243 at 1924 Z. He uses 3 el. Yagi and UW3DX home brew transceiver.

VI3WI, Australia

special commemorative call sign until Apr. 30, 1985. This call is a part of the 150th Anniversary celebration of the European settlement in Victoria. VI3WI will be activated on a roster basis by selected members and clubs. All bands and modes will be used. A commemorative QSL is available as well as a special award for one contact with Victoria between Nov. 84 and Apr. 30, 1985. QSL card plus $2 (VK?) should be sent to WIA, 412 Brunswick St., Fitzroy, 3065 Victoria.

XF4MDX, Revilla Gigedo

is planned to be operational late in February or early in March for 4 days.

XU1SS, Cambodia

is off the air presently as a result of shelling by Vietnam. Operator Kimsan evacuated along with the rest of the Ampil camp. The last time they were heard from was on Jan. 8.

ZC4, SBA Cyprus

has been accepted as a separate country for DXCC Award. The ARRL Awards Committe has voted 6 to 1 to accept the recomendation of the DX Advisory Committee to recognize the UK Sovereign Base Areas on Cyprus as a DXCC country separate from the Republic of Cyprus. When the Republic (formerly a British possession) was established by treaty effective August 16, 1960, the United Kingdom retained sovereignty over both the Akrotiri and Dhekelia military bases. The DXCC Countries List failed to recognize this distinction that had existed since that time. The Sovereign Base Areas (SBA) are part of Breat Britain and easily meet separate country status by virtue of foreign land from Great Britain.

Any credit submissions as a result of this action will not be accepted until June 1, 1985, and will be handled in the following manner: Credits for ZC4 contacts made before August 16, 1960, will continue to be credited to the Cyprus listing. All 5B4 credits count for the Cyprus listing. All ZC4 contacts made after the 1960 date were necessarily with stations operating within the Sovereign Base Areas. Cards that indicate operation from within Bases will be credited. The DXCC Desk will make a good faith effort to ascertain the location of ZC4 stations where the location is not clearly indicated. If in doubt, applicants may submit more than one ZC4 card for potential SBA credit. DXCC members who presently have Cyprus credit for a ZC4 contact made from SBA after the 1960 date may resubmit the card for credit to the SBA listing as well as submitting an acceptable card for credit to the Cyprus listing (5B4). The DXCC Desk will endeavor to assist any DXCC member in applying these administrative guidlines.

ZR6AOJ, Marion Isl.

will be operational very soon beginning in Feb. for about 14 months. He is a VHF operator with special permission to operate HF bands while at Marion Isl.

ZS3E, Namibia

operator Kosie from Outjo is active around 14.188 at 2000 Z. QSL manager is K8EFS.

DXCC HONOR ROLE PLAQUES

are now available for $25 postpaid. ARRL says that this handsome red-and-white on brass plaque, mounted on walnut, comes engraved with member's call. A matching phone or CW sticker denotes mode.

TEXAS DX SOCIETY

is planning another Armadillo Run operating event for 1986 in honor of 150 years of Texas statehood. They plan to activate all 3067 counties in the 50 states. Interested individuals and clubs should sign up for this event.

FRESNO DX CONVENTION

will be April 19-21 at the Center Plaza Holiday Inn, 2233 Ventura Av., Fresno, CA 93721 (209) 268-1000. The sponsors strongly recommend making reservations as soon as possible, directly with the hotel. Featured will be DX and Contest forums, and the returning team from the Clipperton DXpedition. On the technical side, OH8OS and W6KPC will present their findings on computer-controlled beam arrays.

QSL information for DXpeditions sponsored by International DX Fundation

DXpedition Call	QSL Mgr.
C5ACC	WA4VDE
CR9A	WB2KXA
CR9B	WA3HUP
WA4QDE/DU2	N2CW
WD4KMD/DU2	N2CW
W7LPF/DU2	N2CW
FHØCIW	DK9KD
FRØCIW	DK9KD
FRØCIW/G	DK9KD
FHØDZ	DK9KD
FRØDZ	DJ6SI
FRØDZ/G	DJ6SI
FHØEUT	DK9KD
FRØEUT	DK9KD
FRØEUT/G	DK9KD
FHØRX	DK9KD
FRØRX	DK9KD
FRØRX/G	DK9KD
HS1AMU	WB2JRG
J2ØCP	DJ9ZB
J6LFZ	AG1J
J73FW	KB4SA
KP2A	WB2MSH
KP2A/D	AF2C
KP2A/KP1	WB2MSH
KP4AM/D	W6KNH
KV4KV	WB2VFT
KV4KV/D	WB2VFT
PYØSJ	N6CW
PYØSP	N6CW
PYØZDX	WA4ZDE
PYØZSA	N6CW
PYØZSB	N6CW
PYØZSC	N6CW
S21GM	N2CW
K5LBU/ST	K5LUB
SVØAA	N2ØØ
SVØAA/5	N200
SVØAA/9	N200
TU4AV	W2SQT
TYA11	(W2TK (1)
TY9ER	W2TK/N200 (2)
VK6AHI	K8CW
VKØCW	N2DT
VKØHI	N2DT
VP2EA	KB4QB
VP2EET	WB2VFT
VP2MEA	NE4R
VS5GM	N200
VS5KV	N200
VS5MS	N200
VS500	N200
VU2KMK	N7UTX
T2AW	W2HAZ (3)
ZD7HH	W4FRU
ZD8TC	N2CW
1S1DX	K1MM
VK4NIC/3X	W4FRU (4)
4S7DX	WB2MSH
4S7EA	WB4OQU
4S7JA	VE3IPR
5R8AL	WA4VDE
5V7HL	WB2KZA (5)
5V7HL	DK4KD (6)
6WBJI	WA4VDE
KP2A/6Y5	WB2MSH
8Q7AR	K2TJ
8Q7AS	G4CIR
9L1SL	N3ADC
9M6BE	VS5TX
9M6MU	N2CW
9N1MM	N7EB
9Y4DX	AG1J
9Y4JA	AC3A

(1)—K4YT: 4/10-4/16, 1981
(2)—K4YT: 1979 to W2TK; W4MGN 7/80 to N200
(3)—W4MGN: 7/80 to W2HAZ
(4)—K4YT: to W2TK
(5)—7/14-7/16 1980 to WB2KXA; 9/81 to DK4KD
(6)—See (5)

FCC MONITORING STATIONS

TELEPHONES AND ADDRESSES

Allegan, Michigan	616-673-2063
Anchorage, Alaska	907-243-2153
Belfast, Maine	207-338-4088
Douglas, Arizona	602-364-2133
Ferndale, Washington	206-354-4892
Ft. Lauderdale, Florida	305-473-9845
Grand Island, Nebraska	308-382-4296
Kingsville, Texas	512-592-2531
Laurel, Maryland	301-725-3474
Livermore, California	415-447-3614
Powder Springs, Georgia	404-943-5420
Sabana Seca, Puerto Rico	809-784-3772
Walpahu, Hawaii	808-677-3954

+From Long Island DX Bulletin, 19 Sept., 1984 (verified with Grand Island Monitoring Station, 6 October, 1984).

The above is furnished in an effort to curb malicious interference. This well-known activity tarnishes any justification for the existence of Amateur Radio. Consequently, each Ham, worldwide, has a responsibility for these detrimental efforts. The magnitude of this responsibility is a personal judgement, hence lies solely within the Amateur. This list may influence it for Yankees . . . **Editor.**

QSL routes

A61AA	—G3LQP	ED9CM	—EA9IE
A92EB	—KØLST	EL1F	—WD9IDS
AP2SQ	—W3HNK	EL1G	—WD9IDS
AXØPB	—VK6NE	EL2AL	—KW9Z
C21FS	—K6EDV	EL2AT	—OE3NH
C3ØBBE	—OH6XY	EL2CD	—KE9A
C31IU	—W8JAQ	EL2FJ	—JF2QHC
C31MD	—F6AJA	EL8E	—GM4LDU
C53CL	—EA8ZZ	FM7BH	—F2BS
C53J	—DL7AH	FM/W6SZN	—W6SZN
CE3DQR	—W3HNK	FOØRB	—W8LCZ
CN8EL	—W2PD	FYØGA	—NU6X
CO2HQ	—XE1XF	HH2MC	—KB4IT
EA9KF	—WA6OTU	HH2VP	—W1FJ
HIØA	—HI8LC	XE1VIC	—KV8U
	(See Note 1)	XE2MX	—K6VNX
HKØBKX	—WB4QFH	XE2SI	—K6VNX
HKØEHM	—WD9DZV		*(See Note 3)*
HP1AC	—KM7Z	XL1CV	—VO1CV
HP1XKR	—JA7AGO	XN5RA	—VE5RA
HV3SJ	—IØDJD	XX9CS	—KØCS
J3AVT	—W8UVZ	XX9DX	—VS6DX
J6LBR	—W1HHV	XX9TN	—W8TN
J37AH	—W2GHK	XZ5KNU	—9V1VY
J38BS	—WB2LCH	YS9RVE	—WAØJYJ
J73DF	—K4CRU	ZD8SB	—G4KIV
J73LC	—KF4IL	ZD9CC	—ZS2DK
K1KI/PJ4	—K1AR	ZF2HP	—AA8G
KØGU/8R1	—KØGU	ZP5JCY	—LU8DPM
KA2IJ	—KS7L	ZP5XDW	—N4DW
KA2MI	—KS7L	1AØKM	—IØMGM
KC6DX	—KS7L	3A2AF	—F5RV
KC7UU/5N8	—K6EDV	3B8CD	—3B8CF
KD7P/KH2	—KS7L	3D6AA	—KB5DQ
KP2AJ	—WB1GZW	3D6AL	—3D6AT
L8H	—LU4HH	3X4EX	—N4CID
N6TJ/EA9	—WA6OTU	4K1ANO	—RA3AR
NE8Z/PJ3	—NE8Z	4K1CEY	—UY5CEY
	(See Note 2)	4V2C	—W5VUX
OK5R	—OK1KRG	5H3QM	—VE7QM
P29KY	—JR1EMT	5N8FOC	—G3TXF
PAØJLS/PJ2	—PJ Bureau	5N8SHE	—G4HVE
PZ5ES	—N8DE	5R8AL	—WA4VDE
PYØFJ	—PY2AJK	5V7NG	—WB4LFM
S8HZR	—WA2HZR	5W1EZ	—JE1JKL
S42HZR	—WA2HZR	5X5GK	—3D6AT
SVØAC/SV9	—WA4GCP	5Z4DU	—N4IPT
SZ2COT	—SV2SV	6W1CK	—DL1HH
TG9VT	—W3HNK	6W1HF	—WØZUZ
TI1C	—K6VNX	6W1HK	—WØZUZ
	(See Note 3)	6W8HL	—WA4VDE
TL8CK	—F6EWM	6Y3M	—KT3M
TL8DC	—F6EWM		*(See Note 5)*
TL8TX	—KØVZR	6Y5MC	—WA4WTG
V3ZZ	—KE5KK	7P8DE	—N4NW
V9ADX	—ZS6GN	7X5AB	—W2KF
VK9MR	—VK2WU	8P6J	—WA6OTU
VKØCK	—VK5LP	9H3DH	—DF8ZH
VKØGC	—VK9NS	9H3DI	—DF8ZH
	(See Note 4)	9H3DJ	—DF8ZH
VKØPB	—VK6NE	9H3DK	—DF8ZH
VKØYL	—VK3AH	9I2O	—9J2BO
VP2MB	—N4AR	9Q5JE	—DKØHT
VP2MW	—G3RRS	9K2BE	—G4GIR
VP2VCW	—N6CW	9L1GA	—N1AGK
VS6CT	—JA4ENL	9Q5JE	—DKØHT
WA2HZR/V9	—WA2HZR	9Q5MA	—K1VSK
WA2HZR/ZS	—WA2HZR		*(See Note 6)*
XE1IF	—XE1XF	9Y4IH	—WB3AKI
XE1L	—WA3HUP		

Notes

1. For HIØA, one DX bulletin gives the route HI8LC, and another via W2KF.

2. If your Callbook does not list NE8Z, try P.O. Box 62, Rochester, MI 48063. This is the former call for WB8ABN.

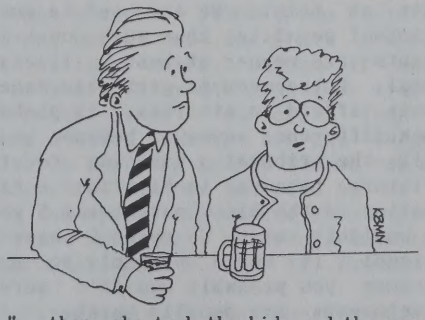
3. Cards for TI1C and XE2SI go via K6VNX for contacts made during the World Wide DX Contests *only.*

4. You may also send your VKØGC card via P29JS. VK9NS and P29JS are the same person — Jim Smith.

5. The latest Callbook lists KT3M; try N3DAY in the older book.

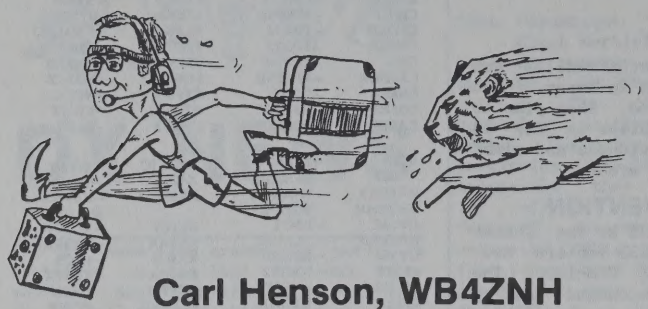
6. The Callbook address for K1VSK is reported to be incorrect. Try Don Berger, 108 Great Road, North Smithfield, RI 02895.

7. The battle of the DX bulletins again. One bulletin says P.O. Box 2416, and the other says P.O. Box 2417.



"...then she took the kids and the car, called a scrap dealer and had my tower and tribander recycled."

DXpeditioning



Carl Henson, WB4ZNH

Black market money: what is it? How does it concern the DXpeditioner? It is illegally received cash and if it exists in a country then it can make DXpedition costs almost reasonable. In Kampala, Uganda, Martha and I lived off of granola bars, for two weeks, because the Ugandan shilling was exchanged with the dollar at a rate of 7:1. This made dinner in the hotel cost about $18. A two block taxi ride round trip came to $50. Well, you say, in that case, I want black market money! Few of us can resist a bargain. However, funny-money is one bargain you should very seriously consider resisting!

In many third world or so-called developing nations, there are currency laws designed to prop up a slow economy. There are those people who could argue that the free exchange of money would do more to stimulate an economy than government controlled exchange. The balancing of exports and imports plus gross national product get involved, but the economics we shall investigate here are much smaller and specific: The economics of a DXpedition.

In these countries, the government has fixed the currency exchange rate and therefore the money is worthless outside of that nation's borders. Invariably there are individuals around who are only in the country temporarily or who want to leave permanently. These people often have great quantities of the national currency (frequently a life savings!), and they must convert the money to a foreign exchange currency before they leave the country in order to take it with them. These folks are quite willing to sell their NARA, SHILLINGS, ZAIRES, RUPEES or RUBLES at a very attractive price. So why not help them and you? Well, one of the prime reasons for the controls is to keep the money (and often the people) in the country. As you might expect, in the type of country we are discussing, life has a much lower value than it does at home. We are used to much less severe criminal penalties than such countries have. Human rights are meager at best. Illegal seizures are legal. Entrapment is perfectly acceptable. If you can't afford an attorney, it probably won't make much difference anyway, because you would probably call the tribunal a kangaroo court! Before the military takeover in Nigeria, a first offense for dealing in the black market was 5 years in prison. I wouldn't want to spend 5 years in a Nigerian prison! It would probably be a life sentence because you probably wouldn't survive. Military governments are usually harsher. Bribery is your only hope.

Black market money? Don't be foolish. Don't do it. If you are foolish, or a little too greedy for your own good, then be careful. You must declare all the negotiable instruments in your possession when entering these countries, and you can be forced to prove it on demand (yes, take out your money and count it for the man - and it had better add up to your declaration!). How can you be careful? I don't know. Each situation is different, but be careful. Better yet don't do it.

I mentioned bribery. "DASH", as it is often called, seems to be a way of life in some countries. It is usually the easiest route. In some places, DASH is almost simply a gratuity. Our policy is that we DON'T pay bribes. This column isn't large enough to tell of all the times DASH was solicited or waited for expectantly.

As representatives of the United States (or any other nation) and amateur radio operators, you and I have an obligation to demonstrate respect for government, humanity and ethical conduct.

Just as sure as answering a W4 while calling for 6s will teach the pile-up that they must call out of turn, paying a bribe will teach government officials that they can earn a nice bonus for selling the service which their bureaucratic job is paying them to provide.

We would all like to see local operators from these developing nations. What chance will the local Ham have of getting a license if you have taught his PTT that amateur licenses are worth $100? Just about a snowball's chance in ....!

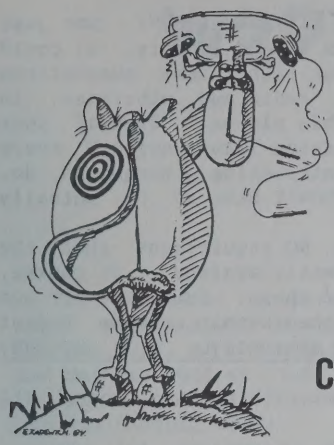
On the other hand, a properly sized true gratuity can be just as important in an ethical consideration. People from industrial or developed nations often complain about beggars and trinket salespersons when they return from underdeveloped countries. Who taught them to do that? You guessed it, we did!

Imagine Joe DXer going to Lower Slobovia on a DXpedition. Old Joe has bought the super super super saver airline ticket where he has to do all of his traveling between midnight and 4 a.m. on Tuesdays or Wednesdays. Joe is going on his first DXpedition. Now ole Joe has an annual income of $40,000. Not big bucks but pretty darn substantial. In Lower Slobovia, the average annual income is $27! Joe has a license in hand, but since his wife left him because of this crazy idea, he has no one to help him string that dipole between those tall palm trees. A local coconut gatherer is happy to earn a little extra and quickly agrees to do the job. In short order, Joe is on the air and ecstatic to get antennas up so high and so quickly. He gives the tree climber $5 for an hour's work. See what happened? Why would a climber who has been paid $2.50 a tree now be content to climb one for less than a penny apiece?

Immediately, everyone learns that tourists are money trees. Overly generous visitors disrupt the local economy and create such a monster that the visitors stop going there because it is so unpleasant. The same way people stop going to the pile-up because it has become so unpleasant. Well, we taught them!

It is difficult to know the proper gratuity. We have an obligation to not be cheapskates also. Be generous, for someone else may come after your operation. Just try to make sure that you don't hurt more than you help. It is not easy. The right way is hardly ever the easy way!

We've looked at the dangers, obligations and ethics of going on a DXpedition; but we want to go on one because it's fun. (Continued on page 10)



HERE'S THE BEEF

C.W. Bug, NØ/FØOL

ARRL is the biggest and only national organization in US. When an organization, company or government get too big they inherit certain negative qualities inherent in bigness; bureaucracy, inefficiency and insensitivity to surroundings are among such qualities. The ARRL is no exception. Some say: Don't knock it because it's the only thing we have! Some people feel that you shouldn't criticize it at all. What keeps such an organization sane? Competition is a major factor. Unfortunately, the only competition the ARRL has is within itself, at elections of officials. There is no other organization that can stimulate or help the ARRL stay fresh, because there is no other comparable group. In the case of amateur radio, perhaps it makes more sense to have a single organization. It may be a monopoly, but it may also have more pull because it presents itself to the outside, non-amateur world, as a representative of the majority of hams. It apparently represents a united front.

So how can amateurs keep the ARRL in line? There are probably two tools: 1. Constructive criticism, and 2. Elections which can get rid of officials that are ineffective.

There are a number of "professional officials" floating around clubs and organizations. These are people who are in the hobby primarily to achieve status through officialdom. They float from club to club, not contributing much. Every organization rises or falls because of the individuals who run it. It is not unusual to see a club bloom because it has a few people who really put their hearts into it. When the "professional" officials get involved, they very quickly mess things up, and the club goes down hill.

There is something brewing at the ARRL. Apparently, about 40 people of about 100 staffers left. There was also a movement to have a union. It would be nice to have some people in that organization who are lovers of amateur radio rather than just people who "do their job."

Let's look at the contest scene. Some time ago, W1XX came up with the idea to make the ARRL DX contest a "world premiere operating event" by changing the rules to be almost the carbon copy of the CQ WW contest. Many amateurs revolted and the ARRL went back to the old rules.

How do you find the ARRL contest result listings? I find them hard to read. You almost have to be a detective to find your own call. Categories are mixed together, titles are not too clear.What a difference there is in reading CQ contest results!

What about trophy "inflation" in the ARRL DX Contest? There are so many trophies that some of them are not even won. Some challenge! I think this really devaluates the value of the trophy and the competition.

ARRL DX CONTESTERS BEWARE! If you are not careful, or don't have two witnesses or a tape recorder running while you operate the contest, you could be disqualified for making a mistake! It has happened. One well known contester won a category by about a 45 percent margin. He got disqualified for having too many errors in call signs or exchanges. He had about 60 errors in 718 QSOs, which is about 8300 characters received. This translates into about a 0.7 percent margin of error. You would think that that's not bad for a tired contester pounded with CW for 48 hours. Quite possibly, some of those mistakes were caused by sending on the other side. Some mistakes are caused by sharp QSB or static crash, where a dash can be broken into two dits, or a dit disappears and makes a S out of an H, or 2 out of 1.It's nothing unusual. By the ARRL book, one mistake equals about 11 mistakes (call sign plus exchange) in one contest QSO. This system is then used to calculate your error rate for "cheating." If you exceed 2 percent, you get disqualified. You would think that disqualification is for cheats, who leave dupes in their log or have phony contacts or multipliers. The rules say that "An entry may be disqualified if the overall score is reduced by more than two percent....Reduction may be made of unconfirmed QSOs or multipliers, duplicate QSOs or other scoring discrepancies." They don't say anything about errors, or counting one error (miscopied letter or number) as 11 errors (call plus exchange). If the latter is the case, then it should be clearly stated, not kept as a secret to deprive someone of results through bureaucracy.

When this contester tried to have things clarified or corrected, he got nowhere. The system said "that's it!" You would think that the Contest Advisory Committee would have a say about this. They never knew about it. They were not asked for their opinion. The "Awards Committee" made the decision, based on the "fact" that there was a 10.49 percent errors rate. So a faithful ARRL member and avid contester got very disappointed. And he feels very bad about the organization that sends him pamphlets explaining what it does for him and how great it is. Then it makes him look like a cheat and disqualifies him for honest mistakes and errors. Letters to ARRL officials and CAC reps did nothing. It appears that CAC and DXAC are there just for looks. The rest of the ARRL likes to ignore them and make their own decisions.

What is the moral of this? When you operate an ARRL contest you should have a witnesses or a tape recorder going all the time, so you can check your own mistakes and, if needed, have proof of what you heard. Using ARRL's interpretation, if a station sends you 5NNTT1 and you write 599001, you could be in trouble. You had better have the other station repeat the call at least twice, because if sent once, it could be modified by QSB or static crash, and you would never know. You could lose a multiplier if the station sent you 579 and forgot to put it down in his log (say he had 599 on top of the page). After all, is this supposed to be a legal affair or a fun sport? You would also expect that a first offender would have the score adjusted and be given a warning. Make note of it. You could be next!

DXers are also treated with questionable rules. Does anybody doubt that XZ9A (and variations of their call) are in Burma? JAs were there. The

present operators are natives. Yet ARRL does not "recognize" them, because some rule saying that a government recognized by ARRL has to give "official" permission to operate. Life in some countries is not as we know it. Ham radio is not #1 on some governments' lists of priorities. Why not recognize the operation, when there is reasonable proof that the station is operating from the country One thing is "Don Miller country" and another thing are XZ9, A61, 5A, C9Ø and others. How come Turkey is "recognized" when no one issued licenses there? I don't think it's ARRL's business how the licenses are issued in Bunga-Bunga. If it is reasonable to believe that the operation is legitimate, recognize it. If it turns out to be a hoax, cancel the credits.

How come ARRL gives DXCC credit for working banned countries? On the one hand, they care about proper licensing in a foreign country; on the other hand, they encourage or recognize "illegal" contacts with countries that are on the banned list of a particular country.

ARRL's latest push is for numbers. Let's get 600,000 hams by 1990! The push for quality is not as obvious. When some people, like WB4ZNH, tried to bring some sense to operating practices, like using list operation, the ARRL would not include a clause saying that list operations are unethical or at least not encouraged. The official response is that the DXCC Award is not a competition. It is not a contest but it is a long term competition for the magic Honor Roll listing or maximum countries worked. As far as I know, 99 percent of DXers consider it a competition. We gradually slid into list operating, without really thinking about what it means. If you tried to shoot an animal in a ZOO, people would think you were crazy. Yet, when you work a station on the list and sometimes you don't even hear him, that's OK. Is it?

The other day I heard A22 running some kind of list with J5 sitting there for 10 minutes without making a contact, while many would love to work him. Wouldn't it be better to teach him how to operate on his own, how to use RIT or outboard VFO? All it would take is about 5 minutes. Some DX stations are actually getting smart. They tune around the band and they call others calling CQ, etc. What a nice surprise.

There is a number of things around ARRL that could use some added sanity and common sense. The officials, elected and paid alike, should keep in mind the fact that there is a whole world out there with hams who have their own special needs and problems. Whatever is done in the US should be done with sensitivity toward the rest of the radio world. That goes for the expansion of bands and other rules. Otherwise, actions could backfire and create a lot of bad feelings instead of promoting goodwill and understanding. Not everybody can afford kilowatts and big antennas. Yet they have the same desires to have fun and be helpful if needed in emergencies.

So what can we do to help? If you are concerned, perhaps run for elected office at ARRL, or at least help to elect people that you know are serious.

KIKI and W7RM are to be applauded for running and winning the elections. We hope that they bring more sanity and fresh air to ARRL. We need more people of their caliber in there. If there is something that bugs you, let it be known.

Do you have any beefs? Let me know via RADIO-SPORTING! I don't QSL, I'm not OK in the Call Book and I don't fool around. 73 Clara, NØ/FØOL

DXPEDITIONING

Next month we will talk about FUN! Not just the fun of operating from a RARE country, we could all enjoy that task, but rather some suggestions for making your own fun, radio and otherwise, in some much more accessible places. Even if your spouse is not a card-carrying "Ham-a-holic," there are attractions and interesting things to do. Family and DXpedition DON'T have to be mutually exclusive!

There is likewise NO requirement that the DXpeditioner be independently wealthy! Of course, these adventures are not cheap, to be sure, but there are ways to bring them within certain budget limitations, legally and ethically. (WB4ZNH)

Just when I thought everything was going all right.....

The CQ World Wide 160 Meter Contest started with a big buzz reminiscent of the spark-gap days I soon found out that the power supply for the ICOM IC-745 had developed shorted capacitors. Switch off the ICOM. Switch on the venerable Drake R4C/T4XC combination and resume contesting.....at least till 0715Z Sunday morning when Murphy came back for seconds and disabled the T4XC VFO. All in all, it was a great experience hearing all the big DX signals and managing to work a few of them, e.g., VP9LB, EA3VY, G3SZA, HB9AMO, GMOAAS, DJ1BZ/A, EA2OP, GW3YDX, GI3OQR, PAOHIP, CT1AOZ, F8VJ, ZL3GQ, K7SS/KH6, PY1RO, YV3AGT, and W1BIH/PJ2. Heard were VP2VI, 6Y5IC and ZS6DN 599 plus.

The station consisted of the above RF equipment plus my new Kansas City keyer bought at Dayton. The gear was set up in my 1977 window van, then it was only a thirty minute drive to the contest site about twenty miles north of Toronto, where my half wave sloper is hanging from the three hundred and twenty foot level of a 350 foot commercial tower.

See you all next year. Joe Caberlin, VE3ABG

No, We don't go out much anymore but Henry is involved with the American Radio Retail League and the Rat-Chewer's Club

W2PV ON ANTENNAS

PART 3

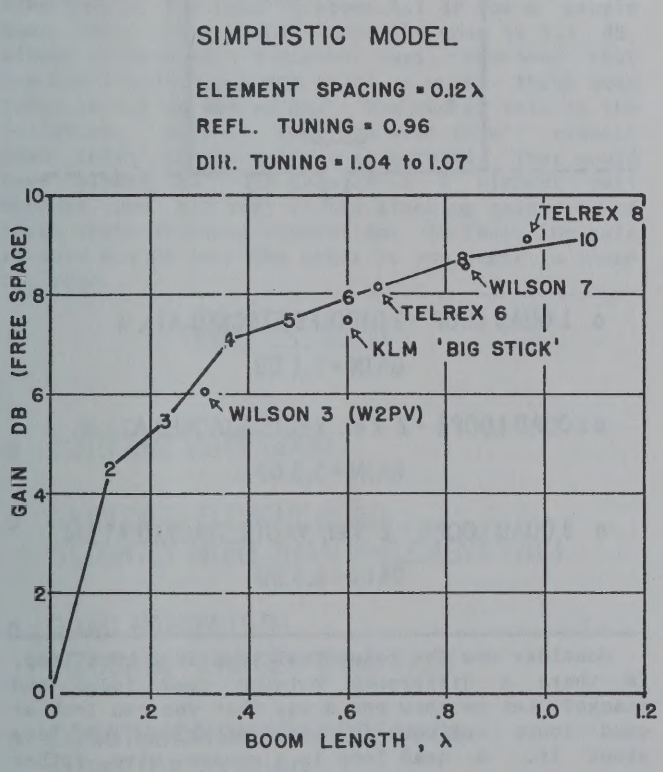
Yuri Blanarovich, VE3BMV

The following is part 3 transcription of the taped presentation given by the late Dr. Jim Lawson, W2PV, at the meeting of the Toronto DX Club and Ontario Contest Club.

Dr. Jim Lawson, W2PV:

Now let me come to the subject of boom gain. What is the situation with boom gain? We have an intuitive feeling that if you make a long boom you should get bigger gain. Indeed that is true. The computer is quite handy because I can make a whole series of antennas with various boom lengths and see if our expectations are valid.

I did that with what I call "simplistic booms," simplistic antennas. What I mean by that is that I made all the director lengths the same, all shorter than the normal length, and the reflector longer. But I did not taper the elements. That's why I call it simplistic. Now I'll tell you something that surprised me. After some years of work, I have decided that for the lengths of antennas we use, that simplistic antenna is as good as any. There is no virtue in taper, but I'll discuss that later. What happens with respect to boom length?



This is what the computer said happened when I changed the number of elements along a given boom length. I made this boom length the same as my 20 m Telrex beam boom length of 46 feet. It is about a 0.66 wavelength boom. You'll notice what is, to me, a remarkable result. That there was essentially no difference in gain going from 4 elements to 8 elements on that same boom length. A difference of a tenth of a decibel, which you would never measure experimentally. I've done this for many other simulations and my conclusion for the moment is a very simple algorithm. The gain of the antenna, if it is a yagi, depends only on the length of the boom, and not on how many elements are mounted on it. That's another parameter.

But you can't go so small that the elements don't couple together. That is why when you go to 3 elements on the very long boom, the gain falls off very rapidly. The spacing is too great for the coupling between elements. With more elements, I think it's a case of me not picking the right frequency. I'm not convinced this fall is necessarily true. In any case, it is negligible.

It makes no difference from this point of view if you put a 5 element or 6 element or a 4 element on the same boom, you're going to get the same gain out of it. But you may not get the same F/B and that will be discussed. It is an astonishing result that I find.

What this says then is that the peak gain is almost independent of the number of elements within wide limits, and that the spacing of your elements should be held within a tenth and a quarter of a wavelength. Anywhere in between doesn't matter as far as gain is concerned. It's going to work fine.

I did another simulation. Suppose I change the boom length and then put on different numbers of elements. Recall that we've determined that the number of elements for a given boom length doesn't mean very much. Now if the boom is longer or shorter, what happens? Indeed, you will always have higher gain with longer boom lengths. These are actual points that the computer calculated; for a 2 element beam, a 3 element beam or this boom length, the simplistic, the 4 element, the 5, 6 and so on. These are actual points in which I simulated, as best I could, the actual dimensions, frequencies of some commercial beams. This is my Telrex 8 element 15 meter beam, the Wilson 7 element we saw earlier, Telrex 6, KLM Bigstick - a 5 element beam. I have two of these, and the 40 meter beam which I finally made long enough to work. Incidentally, I had to increase the length of the elements on the 40 meter Wilson beam by about 6 feet to bring it into the right frequency range. So this will illustrate the tapering of the elements which will be discussed later.

Notice that you get a kind of diminishing return, but it always gives you more gain the longer you make it, and it's intuitively correct. You'll notice that it is really difficult to get a good 10 dB of gain. Not even the long 8 element beam has a real gain of 10 dB over a dipole; but it's a great antenna. It works like a bomb as you all know.

Again, gain versus boom length: for best

GAIN VS. BOOM LENGTH

- o FOR BEST SPACING, GAIN INCREASES MONOTONICALLY BUT SLOWLY WITH LENGTH
- o GAIN NOT DEPENDENT ON TAPERING DIRECTOR LENGTHS
- o AVG. DIRECTOR LENGTH MUST BE SHORTER FOR LONG BOOMS
- o SOME COMMERCIAL ANTENNAS COME CLOSE TO PERFORMANCE CAPABILITY OF BOOM

spacing, the gain varies monotonically, but slowly with length. The gain is not dependent on whether or not the directors are all the same length or different lengths. Of course, you have to make the average length the same, but it doesn't make much difference. The best beams I've been able to design have the directors all the same length.

Some commercial antennas come close to the performance of the boom, but many are not quite there, for reasons I will come to later.

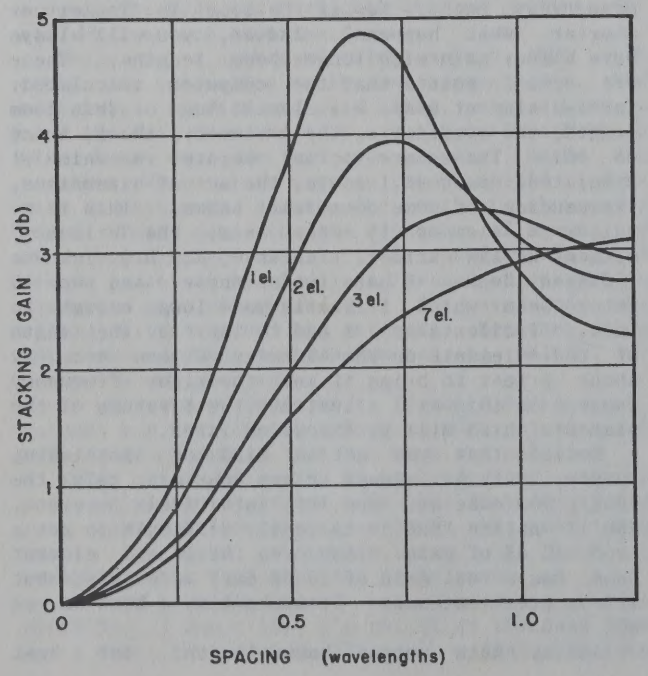
STACKED YAGIS (FREE SPACE)

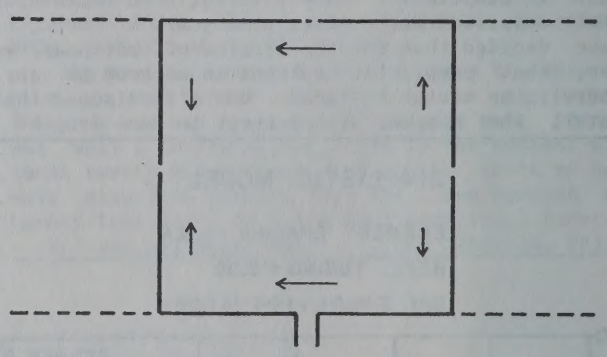
- o HORIZONTAL POLARIZATION
- o VERTICAL SEPARATION (SPACING) MEASURED IN WAVELENGTHS

Let's now turn to the subject of stacking of yagis, a topic that the more DX-minded are particularly interested in. First, I will consider stacking in free space, not over ground. I ran a series of curves. I defined stacking gain as the amount the gain increases by virtue of having the second device, whether it be a one or two element beam, two over two, three over three, or in this case a seven over seven, as a function of the spacing of the stacking. We're all familiar with the saw that five-eighths wavelength spacing is the best spacing to give you a gain. What you and I didn't know was that this is only true if the antenna is a dipole. That's the only case that was ever calculated before. And it's true that if I had two 1 element beams, when I put them five-eighths wavelength apart, I'd get the best gain due to stacking, in the forward direction. That gain turns out, for the 1 element case, to be up to 4.8 decibels over 1 element.

It is too bad that this meant to people that all beams should be stacked five-eighths wavelength apart. That's not true.

The bigger the antenna is, like a 2 element, the further apart the antennas must be stacked to realize maximum gain. If you have big 7 element beams then they have to be a full wavelength apart. When you say stacked beams and they're big ones, they have to be far apart. A wavelength is a good number probably for anything that anyone uses. It will be better to have separation of a wavelength (over the five-eighths) for any big antenna. This is what the simulation shows.





- o 1 QUAD LOOP = 2 DIPOLES STACKED AT λ/4 GAIN = 1.1 DB
- o 2 QUAD LOOPS = 2 2 el. YAGIS STACKED AT λ/4 GAIN = 5.3 DB
- o 3 QUAD LOOPS = 2 3 el. YAGIS STACKED AT λ/4 GAIN = 6.5 DB

Consider now the conceptual idea of a quad loop. Is there a difference between quad loops and stacks? Let me show you a way that you can look at quad loops and come to some simulation and idea about it. A quad loop is a square wire either arranged in a square or a diamond configuration. You drive it in the middle of the top or bottom by a certain current. It's a full wavelength around so that I've drawn these little arrows to show how the instantaneous current vectors might look. In the bottom one you might have a current vector that

way, and the same in the top one. The current disappears to zero at the sides. You will effectively have a driven element at the top and a driven element at the bottom. Now consider these two U-shaped pieces. Since the potentials at the ends of each of these pieces is the same, I might as well separate them with a little gap; nothing changes since they are equal potentials. I would of course have to drive the two but that's a small thing.

I can take this vertical section and I can observe that this vertical section, as far as radiation is concerned, is exactly cancelled by the other vertical section, in the opposite direction. To those of you who know what I mean by it, it generates quadrupole radiation rather than dipole radiation. This means it doesn't radiate. It only generates a local field. Because it doesn't radiate, it acts just like a capacitance and I can fold it down into this horizontal part with virtually no change. But if I do fold it down, then I have just two dipoles.

The summary is that a square loop is mathematically identical to two dipoles separated a quarter wave apart. Remember what I said about stacking gain when things get apart. That has all been calculated. It isn't hard to do. It turns out that the gain of a single quad loop over a single dipole is about 1.1 decibels. That's because of that quarter wave separation. If it had been separated five-eighths wave apart, we would have had 4.8 dB, but we didn't get it.

Remember that when I have stacked yagis, a yagi over another yagi, that are only a quarter wave apart, I don't get as much out of them when they're big. (Recall the last curves.) The numbers are like this. The gain is about 1.1 dB for a single quad loop, for 2 quad loops the gain is 5.3 dB, almost as much as a 3 element yagi, remember that was about 6 dB, but not quite as much. Three quad loops is 6.5 dB and so on. The end of this is the following. Suppose that you went to a 7 element quad loop; that's quite a structure! That would have almost as much gain as a 7 element yagi because you get very little stacking gain out of large beams at close separation. In fact, the gain is only 0.4 dB over the other so you begin to loose the edge.

QUAD VS. YAGI

- o BOTH ARE VERY GOOD
- o GAIN OF N-ELEMENT QUAD SLIGHTLY MORE THAN N-ELEMENT YAGI
- o QUAD BANDWIDTH PROBABLY LARGER THAN YAGI
- o CONSTRUCTION OF LARGE YAGI SUPERIOR TO QUAD

That's the way to look at it. But the thing I now feel is that quads and yagis are both excellent antennas. They aren't any different, really. They are both good antennas when properly adjusted. The gain of an n element quad is slightly better than an n element yagi, but not by much. Probably a difference that you couldn't measure. The quad bandwidth may be somewhat larger than a yagi, but I'm not sure that is true. It could be true if you made it out of the same fat conductor. It would be true then, but we make quads out of thin wire which, unfortunately, has an intrinsically high Q and yagis out of fat conductors which are intrinsically lower Q. They may, in fact, be similar, but that's a judgement that has to be made on the specific one you build.

The important thing from a ham's point of view and the one that I believe (although Yuri, VE3BMV, may prove me wrong), is that the physical construction of a large yagi is most likely to stay up there over tough winters and icing better than the kind of quad loops we customarily build. But take your pick. Be my guest. Either one is a great antenna, and if you can keep it up all the winter that's fine.

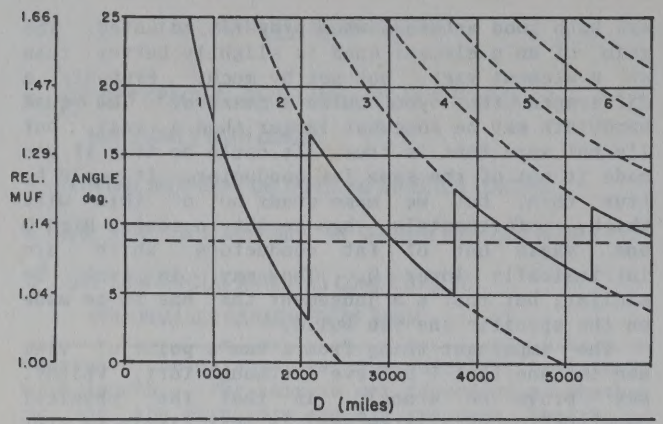
ANTENNA SYSTEMS

- o GROUND REFLECTIONS
  - o VERTICAL POLARIZATION - REFLECTIONS IN PHASE
  - o HORIZONTAL POLARIZATION - REFLECTIONS OUT OF PHASE
- o VERTICAL ANGLE OF RADIATION IS
  - o PRIMARILY DETERMINED BY ANTENNA HEIGHT
  - o SECONDARILY DETERMINED BY ANTENNA DIRECTIVITY

So far I have been talking about free space. But we don't have free space. Our antenna system is over ground. Ground reflections affect vertical polarization and horizontal polarization somewhat differently. Theoretically in vertical polarization, the image in the ground is in phase. So you have a phase addition. In horizontal polarization the reflections are out of phase along the median plane. The vertical angle of radiation we'll see is influenced almost entirely by the height of the antenna above the ground and not by the kind of antenna you put there. Stated another way, you put a dipole at 100 feet and it will have lobes at certain angles and so will a big antenna at that same height.

But there is a secondary effect you will soon see. Think about it as: the vertical angle of radiation is influenced mainly by the height of your antenna system over ground, and secondarily by the antenna directivity.

Before I get into the rest of the ground I want to introduce an overly simplified conceptual model of DXing over the earth. What I have drawn is a curve based upon F-layer "reflection" from the ionosphere as a function of the range in miles from where you're transmitting. Let me explain what this curve is. Vertically, I have plotted the



angle of radiation, or the angle that you're talking about, as a function of the range. This first line here tells me what the "first hop" does. For instance, the first hop that starts off at grazing angle comes down 2400 miles, or in California, let's say. But it can hop twice or more. Note that if I start the radiation up at 10 degrees, the first hop comes down at only 1400 miles. It comes down at the same 10 degrees; it is symmetrical.

Now, we have a problem. Suppose I put a big antenna way up in the air, where does the radiation come back down to the earth? It comes down only at discrete points and nothing else. If a station happens to be in between that, he won't be able to get it with that high antenna because you'll have to get it on the second hop with an angle of about 7 degrees. You can see conceptually that if I want to work stations with continuous ranges from 2000 to 5000 miles, like throughout Europe, I must have an antenna system that accepts a range of angles. It's wrong to say I need very low angle. What I really need is all the angles between about 5 to 20 degrees.

If you are a DXer, you must get your antenna to accept a wide range of angles and that makes things a little more difficult. What is the angle you would like to have? You will notice that, from this analysis, a pretty good angle would be about 8 or 9 degrees for the main lobe, that stretches out from 4 to 15 degrees around the main lobe.

This is to give you an idea as to why you need the angles, but this is overly simplified. The actual propagation is more complicated than this. The next diagram I will show you comes from a paper by a man by the name of Kift, who was in the Ascension Islands and ran a series of tests to South England where they did two things, and I found it very nice to find. They had continuous ionospheric soundings of many points in that path, so that they knew what the MUF was at every point and they ray-traced the original transmitter angle to find out where they would come down on those things, and they compared that with observations. Let me show you what that kind of a curve is. It looks very complicated. This is the great circle distance from the Ascension Islands to the South of England. This is the same vertical angle, 0 to 30 degrees in this case.

The little pieces are the different lobes by which that particular signal or ray-trace got there. It says there was one hop on the E-layer. Note that the Es is a Sporadic-E "cloud." This one is a single hop on the F2. Now you'll notice that this isn't quite like what I drew before. It is more complicated because of focusing effects of the rays when they go up through this arrangement to come down. The interesting thing is that they don't cover all the ranges, even if you went to a continuous set of angles. There are some distances here in which there is no way the signal will get back to earth at all.

In England they were able to measure the received angles. They did that by the ratio of signal on lower and higher antennas, as we are doing in ham circles now. These were the distributions of measurements made on reception, and sure enough it agreed with the fact that it went by a M-mode (bouncing off the F-layer back down to the top of the E-layer up to the F-layer and back down again), plus one more F2 skip. You'll notice that the angles that the signal was arriving at were again not down to zero, but around 5 or 6 degrees in this case.

They also looked at time delays which correlated to that, too. All I wanted to show by this picture is that the real world out there is more complicated than the very simplistic chart I originally drew. But I'm sure now that if you did this for all the conditions and all the different types of things, the conclusion you would come to would be that you don't just want low angles, but a range of "lowish" angles.

I've come to believe that the most important ones in DXing for frequencies about 14 MHz are the angles below 20 degrees. But I don't mean, by that, that 3 or 4 degrees is any good. I like 8 degrees as the average, you'll see.

"OPTIMUM" VERTICAL ANGLE
(F-LAYER REFLECTION)

- LOWEST ANGLES FAVORED IF MUF LIMITED
- LOW ANGLES FAVORED BY ATTENUATION
- HIGHER ANGLES FAVORED IF ABSORPTION LIMITED
- HIGHER ANGLES (LOW ANTENNAS) USED BY MOST HAMS

CONCLUSIONS: (5^0 to 15^0 ANGLES VERY USEFUL)

Let's see what the conclusions might be. First of all, the lowest angles are generally favored if you are MUF limited, because when you go up in angle, no longer will those frequencies ever come back anywhere. They (the low angles) are also favored by the minimum attenuation. You get the strongest signal, in fact. The rough rule of thumb is that you should be at the 85 percentile of the MUF's over the whole curve.

Unfortunately, it doesn't show here but I wanted to say that the higher angles are sometimes favored. I haven't proved that yet, but higher angles are preferred if you have absorption in the path, especially at one end. Typical is at 40 meters. The first thing you hear from Europe on 40 meters is high angle stuff. With two beams up, as I have, the lower beam always gets it first. It's only when night falls and absorption falls that the high beam goes like gangbusters. But that's a kind of special case. (To be continued.)

FRED HOPPENGARTEN, K1VR

LISTENING ON 160

or

Glendower - I can call spirits from the vasty deep.
Hotspur - Why, so can I, or so can any man; but
will they come when you do call for them?

...Henry IV, Part 1, Act III

I've devoted quite a bit of this past fall to getting on 160. Among the readers of RADIOSPORTING we have many with considerably more experience on the band than I have, but being new to the band has its advantages too. All my problems and mistakes are fresh in my mind. Perhaps a few of these experiences will save you some of the grief that I've suffered.

When I first got on, I found that the 160 meter band was full of birdies, noise and signals that others could hear but I couldn't. Here's what I did to cure my problems.

Birdies

At all sorts of odd intervals across the band, I found that someone had inserted a birdie right on top of stations that I wanted to hear. The primary solution: a high pass filter. Source: Webb W1ETC, "High-Pass Filters for Receiving Applications," QST, October 1983, p.17. N1RC built it right into the Beverage box which switches directions for my Beverages.

What? You don't have a switchable Beverage? See N1RC and K1VR, 73 Magazine, October 1983, p.10.

The high pass filter cuts off at 1.7 MHz and gets rid of all sorts of broadcast station trash. However, it does have a cost...3 dB insertion loss. Note that if you are truly close to a broadcast station, the toroid core may saturate. In that case a classic high pass filter using coils would be required.

I thought that a high pass filter was all that would be required. Instead, I discovered that I had only peeled away one layer of birdies.

The second layer turned out to be a cordless telephone transmitting in the 1.7 MHz band, above the cut-off of the high pass filter mentioned above, and generating a lot of crud. Unplugging the cordless phone really helped. I am still not sure, however, to tell the truth, that I've ended the birdie agony.

A neighbor toward Europe may have a cordless phone too. While this would ordinarily be harmless, my Beverage comes close enough to that house to pick up a phone there too, if it is on. Fortunately, I suspect that the offending neighbor may not be using that telephone during the evenings because its front end is probably wide enough to go beserk when I fire up with a kW at 1.8 MHz. So this problem area seems to have been beaten down into a non-problem.

Noise

Noise that was hardly noticeable at 3.5 MHz, all of a sudden became unbearable at 1.8 MHz.

First, I went and bought the Interference Handbook, by William R. Nelson, WA6FQG, former RFI Investigator, Southern California Edison Company, published by Radio Publications, Inc., Wilton, CT. I found it at the Ham Radio Bookstore. It explained a lot to things that I knew only vaguely through folklore, and offered great comfort that I would one day find answers to my problems.

Second, I physically inspected each Beverage for bad connections. Boy, did I get lucky. The ground wire from an outdoor impedance matching box (this means that it contained the toroid) had broken on its way to the ground rod below. Installing a wire thick enough (#12 solid copper) to withstand being tripped over by a human or a dog solved the problem.

Third, I added several radials of insulated wire, 20-33 feet long, which were hanging around my cellar (leftovers from the radial system on the 80 meter verticals). I wish I had a good answer to the twin questions: How many are required to be enough? And, how long should they be? But I don't. On the other hand, W1RR is experimenting with wires on the ground underneath his Beverages to improve the ground even more, so you can harass him into writing up his results. I don't know. Nonetheless, all the texts recommend radials at each end of a Beverage.

Fourth, I specified Lutron, Centurion model light dimmers when we redid the lighting in the living room. These are more expensive than the usual sort, but worth it if you value your sanity. They were $22.40 each at Wolfer's (a comprehensive lighting supply house), Watertown, MA., 617/254-0700. Ask for Janet Rome. Or call Lutron's hot line 800/523-5466, for the name of a local dealer.

However, I had completely forgotten about the dimmer in the kitchen. For months I kept a record of when a very loud noise would come on. I tried to recognize patterns with respect to time, temperature, weather and day of the week, to no avail. Then one evening it hit me. My wife finished some work in the kitchen, turned off the light, and walked into the shack. All of a sudden I knew.

Weak Signals

The Outdoor Splice

During the course of my physical inspection of the Beverages, I discovered an F connector splice (an F connector into an F-81 barrel to another F connector) in the RG-59 feedline which I had left outdoors on the ground. In the haste of installing the system two years ago, I had violated the cardinal rule about protecting outdoor splices from the weather. At the time, discovering whether or not the new Beverage would work was imperative. The task of going back to weatherproof the splice just slipped away. Water had invaded the coax and I had

to cut back three feet on either side of the splice before I found fresh coax.

Speaking of outdoor splices, CWY (a cable TV manufacturer) has invented the cutest little splice system. They take a grey PVC plastic plumbing splice, the kind of thing that joins two hoses, together with two cane tips, the rubber bottoms to a cane, and shove the cane tips on each end of the splice after drilling a hole in each cane tip. The holes are a bit smaller than the RG-59; but by lubricating the RG-59 (or RG-6) with spit (or soap and water for the more fastidious), it becomes possible to shove the cable through. Now you can step on the splice and know that it won't be damaged. Assembly is much easier than any other splicing system I've seen. On the other hand, it would be inappropriate for a mid-air span.

The Preamp

With a new baby in our house, I've become a devotee of checkbook construction. Instead of building a preamp, I bought one from Advanced Receiver Research (W1VD's company), P.O. Box 1242, Burlington, CT, 203/584-0776. Their Model P1-30/20VD, in a rugged aluminum case with BNC connectors, costs $32.95, postpaid. The board without the case and connectors is only $22.95. In this form you can mount it yourself inside your Beverage switching box. ARR does not advertise this product. It is apparently a specialty item for DXers and contesters.

The preamp yields 19 dB gain across 1-30 MHz, using 10-16 VDC at 10 mA. In addition to its use on 160, it turns out to be handy on 10 when the band is dying and that ZK2 is but RS 51 or 52, instead of the 59 which would make it easy.

During the first two weeks of use, my preamp blew the transistor. It could have been too much electricity in the air from a nearby lightning storm, or too much RF on the Beverage from my own transmissions, but a pair of back-to-back diodes, installed by the factory, has cured the problem. W1VD cautions that one should check to see if the diodes are causing any TVI.

For the more adventurous, there is a useful circuit in "Resurrecting the Beverage Antenna" by Smith, W5USM, 73, June 1978, at page #55. The circuit was apparently designed by famed 160 meter man K1PBW. See also "Build This 'Quickie' Preamp," DeMaw, W1FB, QST, April 1977, and Reisert, W1JR, Ham Radio, December 1984, page 99.

Interantenna Coupling

Everyone advises that you get a Beverage as far as possible from transmitting antennas. But after erecting a two element vertical phased array on 80 (a pair of ColAtchCo 42 footers), northeast/southwest, I found that my Beverage was two feet from the southwest vertical and eight feet form the northeast one.

In the course of experimenting, I discovered that if I switched the vertical array from NE to SW, signal levels would change dramatically. It took three hours, but I moved the Beverage. It is now 10 feet from the southwest vertical and 20 feet from the northeast. It isn't what I'd like, but, since I live on but 1.3 acres, it was all I could do. However, it seems to be enough. Now, no matter what I do to the 80 meter array, it doesn't affect reception on 160.

Hearing the above story, AA1K/3, renowned 160 man, told me that he routinely decouples other antennas by shorting or grounding them to reduce this problem.

Usefulness

All of the above may seem like a lot of work for a mere 8 to 15 countries during an all band DX contest. However, with good receive antennas, it is possible to save a lot of time on 160. In other words, if the objective is to get in and out, receive antennas help. Having finished all the above work on the Beverage receiving system, a new benefit came to light. All of a sudden a new layer of signals became readable on 80. Now, I'm starting to get cards from guys running Ten-Tec 5 watt transceivers on 80!

In addition, 160 is a nice place to seek new adventure after achieving 5BDXCC. Its a long winter between CQ and ARRL contests.

Good luck with your receiving system. Remember, the better you hear, the less you'll transmit after that rare one has already come back to me. (K1VR)

Mr. Hopengarten, when he is not chasing DX or shouting "CQ Contest," is president of Channel One, a satellite TV services company in Waltham, MA. As his training is in law and business, he hastens to point out that he'll feel no offense if someone criticizes his engineering, and welcomes comments on this article.

Send to: Fred Hopengarten, K1VR, 6 Willarch Road, RFD 1, Lincoln, MA 01773.

Telling lies at YCCC hospitality suite during the Dayton Hamvention. L. to R. Fred, K1VR, Yuri, VE3BMV and Pedro, NP4A after emptying a few cans of beer, supposedly to be used to build the Beer Can Vertical.

****

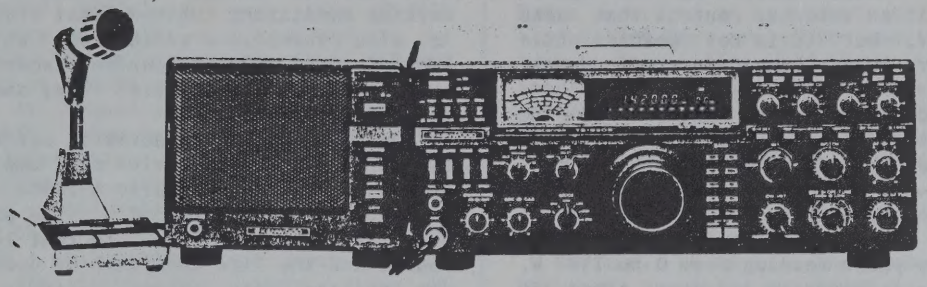
Watch for the announcement about the IRSA Super-hospitality suite at Stoufer's Hotel in Dayton. In cooperation with Southwest Ohio DX Association, the suite will be open from 7:30 until midnight on Friday and Saturday. If you have an interesting presentation, please inform VE2ZP or W8ILC.Arrangements are being made for the Annual IRSA Awards dinner-buffet on Saturday night. More info later.

****

A CONTESTER'S LOOK AT KENWOOD'S TS930S

Yuri Blanarovich, VE3BMV

PART 2



In the first part of our review we looked at the receiver part of the TS-930S and frequency controls - tuning and bandswitching. We also had pictures and a description of the front and rear panel controls and a list of specifications courtesy of KENWOOD. We also had curves of IF selectivity using various filter combinations and settings as measured on my transceiver.

This second part looks at the rest of the TS-930S transmitter and antenna tuner. In a separate article, Court, VE3AZ presents modifications that make this excellent piece of equipment even better.

The transmitter part on SSB and AM mode starts with a microphone amplifier. The older version had a movable jumper on the main board that allowed selection of either 500 or 60,000 ohm input impedance. The later units have an "automatic" amplifier that is optimized for a variety of impedances. Overall, the audio quality from the TS-930S is excellent. This is the first transceiver with which I had been told to keep the compressor turned on! Properly adjusted, the speech processor is excellent. It is an RF type of speech processor and can be turned on and off by the switch on the front panel - PROC. The adjustment is done by two concentric knobs PROCESSOR IN OUT. The METER knob is first switched to ALC and PROCESSOR OUT is adjusted so the needle on the meter moves within the red field, with processor turned on while you talk with a "regular" voice. Then the MODE switch is set to COMP and PROCESSOR IN is adjusted so that the needle moves within the red field on the meter, again while talking with a "regular" voice.

If the PROC is turned off, the microphone gain adjustment is done using a separate MIC knob. This allows presetting of controls for both modes, without the need to readjust them. The quality of modulation can be checked by turning the MONI switch on and listening to your audio or CW on headphones. You can tell very quickly if the background noise is too loud when you are not talking by looking at the power output meter. Generally it is good practice to keep your eye on your output meter to see if there is a deflection when you are not talking into the microphone. There is nothing worse than having the roaring sound of your fans only 5 dB below your audio.

A properly adjusted compressor is a real help. It can give you as much "help" as an average amplifier. Too much gain might make the meter show more output power, but that power might be going to noise and other things as a result of having a poorly adjusted compressor or overdriving the amplifier stages. It is good to check the quality of your audio, especially if you have a new radio, microphone, or any other gadget that might impact the purity of your signal.

The microphone used has a lot to do with audio quality. Some people have a two-thousand-dollar radio and then they buy a microphone cartridge for 25 cents. It will sound like it cost 25 cents. It pays to experiment with different microphones. Select one that fits your radio and your voice. I normally use a Kenwood hand-held mike (I never got used to mikes on stands). When contesting, I use a home-brewed boom microphone (a Sony ECM-150 miniature microphone plus a 10-inch piece of #10 copper wire used for the boom). A sponge type of wind screen eliminates the sound of heavy breathing. Apparently, HEIL sound microphones and elements are very good for this purpose. I haven't used one yet.

Some people like to use VOX. I very seldom use it. I prefer a foot switch. It gives me some exercise during a contest, and it gives my feet something to do. If I sneeze or yell at the dog, it doesn't go out. It saves the relays in the rigs and amplifiers. (They have a nasty habit of quitting right in the middle of a JA pile-up.) Using foot switch, first you switch your machinery to transmit, then the signal is applied, hence there is no arcing. Some amplifiers have an improved sequence of switching to prevent that, but I still prefer "dancing" on my foot switch.

For the discriminating CW operator, there is also a VOX operation and an option to use SEMI or FULL break-in. Both features are excellent. The keying waveform of the '930 is excellent and I haven't heard one with a clicking signal yet. The tone is nice and stable. As mentioned in part 1, the carrier or CW signal is related to the received signal. So even if you are almost dead zero beat with the station you are calling, you know where your signal is.

I have one complaint about the power adjustment on SSB or CW. When you are trying to adjust the output power level in CW or TUNE by adjusting the CARR control, initially the power fluctuates and

the adjustment is coarse. You have to keep it on for a few seconds in order for the signal level to stabilize. This is inconvenient, if your amplifier is sensitive, for proper power level setting. Another deficiency is with SSB power level adjustment. The only way to control the amount of "SSB power" is to adjust the audio gain. With the processor on, it is PROC OUT control. With the processor off, it is MIC gain control. The power setting should be accomplished by one control regardless of mode. That should limit the maximum power going out, while preserving the speech waveform. There is an internal control that sets the maximum power, but it is not usable while operating. You have to take the covers off to make the adjustment.

The METER switch controls the function of the meter on transmit. While on receive, the meter serves as an S-Meter. The calibration is excellent, about 5 dB per S-unit. On transmit you have a choice to measure the output of audio stages in positions COMP and ALC, as mentioned above. POWER position gives you power reading from 0 to 150 W. The power reading is accurate and very close to what BIRD Wattmeter reads. You can actually set your power to 1 W. The scale is logarithmic and "tracks" very well. SWR position is used to check your SWR (this is really something). It is independent of power level! You do not have to set the full deflection and then switch to reverse. It is all automatic from a power level of about 5 W all the way to maximum. Wow! The circuit is "fixed". There is no adjustment for nulling the bridge. In some cases there might be a slight error when the minimum SWR does not coincide with 50 ohms. I like good old meters with needles over the "idiot bar" -- LED indicators. When doing some measurements or adjustments, the good old analog meter makes more sense. The remaining two positions on the MODE switch are IC and VC and they allow you to monitor the current and voltage on the final transistors.

For those with night vision there is a DIM switch. This allows you to dim the displays. I keep it on DIM all the time. It saves the lamps and the intensity on DIM is more pleasant when operating indoors. This switch is often revired and used to control other things, like extra filters, scanning, etc. Overall the display is excellent and is visible outdoors.

There is no tuning of RF stages required on transmit. All circuits are pretuned and broadbanded. All band switching, up to the final stages, is done very quickly by diodes. One can actually operate in full break-in mode crossband, using two VFOs. Display follows the VFO used at the speed of keying. Relays are used to switch the band-pass tuned circuits after the final amplifier.

The power amplifier module amplifies the signal by about 40 dB, using a three stage wide band amplifier consisting of pre-driver, push-pull driver and push-pull final amplifier. The final amplifier uses Motorola transistors MRF422 with excellent IMD characteristics. The maximum collector dissipation is 290 W and the voltage used is 28 V DC. Large heat sink with built-in fan is used to dissipate the heat generated by the transistors. The fan is turned on when the heat sink temperature reaches approximately 50 degrees C and is turned off when the temperature drops below 45 degrees. In case this cooling is not sufficient, and the temperature will reach about 75 degrees, the detection circuit applies higher voltage to the fan and that cools the heat sink rapidly. This type of protection is especially welcome by contesters, RTTY, SSTV and other "heavy duty" users. Yet, while in receive mode or light duty transmit mode, the fan is not operating, unless heat sink gets warm. The power amplifier module has its own compensation for changes due to heat. The bias for final transistors is adjusted automatically and maintains proper working conditions. Another protection scheme utilizes the SWR detection, and if SWR starts getting over 1:1.5, the gain of the amplifier is reduced so as not to exceed safe working conditions for the final transistors. There is also overcurrent protection, which causes cut-back of power when the current exceeds about 15 A. (How about power V-MOSFETs? They should be showing up in newer radios.)

The power output is normally set to be about 110 W. It is adequate to drive most amplifiers. If you have a "deaf" grounded grid 4-1000A, then you have some room to go up to 150 W. The power adjustment pot will set maximum power to that level. Those who understand the life and death of power transistors can utilize this option. (After the warranty expired?) You can still reduce power with your front panel controls. Amazingly, output power is just about constant regardless of band, even on ten meters. Hats off to Kenwood engineers! (Can we get one solid state kW?)

I have opted for the optional automatic antenna tuner, mainly for the extra attenuation of harmonics. I need this because of my neighbors' TV sets. It is also handy for matching an odd-ball antenna. One word of caution: this tuner is in the circuit only on transmit, not on receive. Also, I lose about 12 Watts out of 120 when the tuner is turned on. This is fine for harmonics, but it is a significant loss when I need that extra bit of power to drive the boiler. The tuner ads about 20 dB of extra attenuation on harmonics, so those of you in a city might appreciate it. The tuner is fully automatic. Turn the AUTO switch ON (from THRU), switch MODE to TUNE, press PTT and presto. The tuner goes zoom-zoom, and when SWR gets around 1:1.2 or better, it stops. While the tuner is working, a little LED just below the frequency display is on. The tuner mounts inside the transceiver and can be installed at a later time.

The tuner operates from 80 meters through 10. It does not operate on 160. It would need large components for 160, and I think that's why 160 was omitted.

For those that would like to automate amplifier bandswitching, there are TTL signals available at the connector between the transceiver and a tuner. You can use those lines to operate the relays that can switch bands or amplifiers. All you have to do is press a pushbutton and you switch to another band within about 3 miliseconds!

The power supply delivers 28 Volts for the power transistors and the rest of the radio. This rig will not operate off 12 V DC, although such a feature would have been useful if one was forced to operate off a car battery or 12 V generator. This radio is not in the category of portable toys; it is a serious and competitive piece of fine equipment. It weighs about 40 lbs. because of the heavy duty power supply which is built in.

The power supply regulators have their own heat sink with a similar protection circuit and their own fan. After about two months, the fan develops a slight rattling sound. I think this is due to an unbalanced fan blade (or set screw?). It happened

to me on two transceivers, so it must be "designed" into the fan. Hi. The fan only operates when the heat sink gets warm. The power supply can operate on popular voltages of 120, 220, 240 VAC, and on 50/60 Hz current.

There are some accessories available: extra IF filters, precision main oscillator, speaker box with audio filters, different microphones (you can scan the dial with the mike's pushbuttons), station monitor, digital world clock, headphones and, from other suppliers (International Radio, Fox-Tango Corp...), a variety of kits and components.

As far as overall performance goes, the TS-930 is the best piece of equipment I have had in my shack so far. For the serious CW operator, SSB and other modes, it is really a pleasure to operate. I can say that it helped to boost my scores in contests by a bit. Mine has performed reliably, except for the intermittant joint in the PA module. The plated-through hole decided to act intermittently. Some early models had similar problems, but I think this has been rectified. This radio has been a real workhorse at many contest installations. The front panel layout, size of knobs and readable dial contribute to ease of operating and reduce "radio elbow" and fatigue.

What would make it even better? I would like to see the XIT, continuous AGC time constant adjustment, improved noise blanker (remove the "holes" when blanking), small digital clock with GMT/Local time as a part of the display, the band switching TTL lines brought to the rear connector, more room for IF filters, true and finer transmitter power adjustment, retention of the last frequency used on the band after band change, and, for computer freaks, an option of remote controlling the radio. (It can be done with the TS-430S.) All those, plus some other features would bring it even closer to that proverbial dream rig.

As far as maintenance goes, all the new solid state radios are much better off than the old tubies. They are much more stable and alignment does not drift that much. With Drakes, I had to realign at least once a year. Those who get under the skin of new marvels can squeeze a bit more out of them by carefully realigning them. (See the article by KB9I.) And of course, nothing is so good that it can't be better. Keep adding little bits and pieces, and they can add up to 200 or more contacts in a contest.

The price for the TS-930S with antenna tuner installed is around US$1600.

When is the new model (TS-1030S?) coming out?

If there is an interest, we can describe some more modifications in the future issues of RADIOSPORTING. In the meantime, do not get intimidated by all those knobs. The more of them, the merrier! (VE3BMV)

"I'll get the bugs out of you yet!"

INTERNATIONAL GOODWILL TROUGH AMATEUR RADIO

This is the motto of the IDXF! We have fulfilled the motto many times by helping Third World countries with equipment and QSLs. We have gone on DXpeditions and helped many operators get credit for rare countries. But, perhaps we could do more via international person-to-person contacts and exchange visits.

That is what Barbara Sweet, WA2KCL, IDXF Vice President of Administration, is doing as an Amateur Radio operator in her county through an organization called Partners of the Americas. This group is private, non-profit, and links citizens of 26 Latin American and Caribbean countries. Fifty different partnerships exist. Barbara's county, Dutchess, is thus associated with the island of Dominica.

To improve communications with Dominica and to promote international goodwill, she met with several members of the Dominica Amateur Radio Club on 20 meters. This began in May, 1984.

Earlier, in April, the National Association of Partners appointed Ray Lynch to oversee and help emergency preparedness in these 26 countries. In turn, stateside committees and country partnerships began to be formed.

These formations occurred in Dominica in June. In Dutchess County the next month Barbara was appointed Chairwoman of Communications and Emergency Preparedness. Prior to this time Hams of Dutchess County were meeting weekly with Dominican Hams. They meet Thursday at 0100Z around 14.270 MHz to exchange ideas and to learn about one another. Barbara is to meet during October for 10 days with the Communications and Emergency Preparedness group of Dominica. She hopes to stay in the home of another Amateur and to have a license to operate. When she can, she will be on the air to give contacts in the usual IDXF fashion. When off the air, she will be in meetings with police, hospital, Red Cross, the newspaper, and, perhaps, the radio and TV stations.

Exchange visits are planned with J72PD, K2GBH and J73CS in New York.

The goals of IDXF are being met through these expansive efforts of Barbara and Herb (K2GBH). (Surely these are efforts to spur the rest of us onto similar accomplishments. Thanks Barb and Herb - ED.).

Anyone interested in Partners of the Americas (W5YI Report, 15 October 1984, says this self-help program began as an afterthought of President Kennedy's Alliance for Progress; "one key to the program is finding some common bond, no matter how tenuous, between Americans and the Latins with whom they work." (ibid, p.6). It "...is the largest, private voluntary organization in this hemisphere pairing sections of the US with sections of Latin America and the Caribbean." (ibid).) and wanting to help a community and sister nation should contact: The National Association of Partners of America, 1424 K Street NW, Washington, DC 20005, ATTN: Ray Lynch. Barbara Sweet, WA2KCL (IDXF Newsletter).

RUSSIAN RS–6 IS DEAD

The Soviet Amateur Radio satellite, RS-6, is dead. Apparently, Russian control stations monitored the bird as it failed. Meanwhile, the Soviet RS-3 satellite is showing feeble signs of returning to life. (CRRL NEWS, December 9)

MODIFICATIONS FOR TS-930S

COURT BROAD, VE3AZ

The Kenwood TS-930S transceiver has been a runaway success within the amateur fraternity. With features galore, it satisfies the most discriminating amateur. However, did you know that it has additional features hidden away in its electronic circuitry? Well, if you didn't then the purpose of this article is to tell you what they are and how to implement them.

There are five features that I am aware of that can easily be implemented by most amateurs using commonly available hand tools, a low wattage soldering iron and a modicum of patience. The five hidden features are:

1. Additional bank of eight memories.
2. Dial readout to 10 Hz.
3. Memory scan.
4. Transmitter operation over the entire 3-30 MHz spectrum.
5. Greater resolution of the main tuning dial.

All of the above features involve simple wiring changes to the '930 digital board. For ease of implementation it is highly recommended that the digital board be removed from the transceiver. First, disconnect the AC power cord. Remove the machine screws securing the top cover of the radio. Remove the four self-tapping screws securing the speaker assembly. Lay the speaker assembly on top of the automatic antenna tuner, or in the area occupied by the antenna tuner if not installed. The digital board is now visible. Carefully remove the sixteen plugs which connect the digital board to the rest of the radio. The wire cable is so organized that it would be difficult to place a plug in a wrong socket upon reinstallation after making the necessary wiring changes. In addition, adjacent plugs have different numbers of pins so it makes it doubly difficult to make an error. For example plug number seven contains seven pins, while adjacent plug number six contains twelve pins. Now, remove the six self-tapping screws securing the digital board. Carefully clear away all the disengaged plugs and remove the board to the work bench. It would be advisable to have a copy of the '930 service manual available to aid in the work at hand. Failing this the appended drawing will provide the required pictorial information.

Let's start by adding the 10 Hz dial readout. Locate socket number eight (see drawing). Using #22 AWG tinned copper wire, solder a jumper wire from pin 8 to the adjacent ground point. This is done on the underside of the board. That's all there is to the change! Once in operation, the dial readout will have shifted one further decimal place to the left and 10Hz readout of the displayed frequency becomes a reality. The stability of the stock '930 is certainly well within 10Hz after warm up, making the present frequency operation for such modes as RTTY very simple, straightforward and efficient. When this feature is implemented, you will want to carefully adjust the '930 system master oscillator by zero beating against WWV at the highest received frequency (15 MHz or 20 MHz).

In concert with the implementation of the 10 Hz readout feature, it is suggested that you perform the change that increases the resolution of the main tuning dial. By cutting one end of D13 on the digital board, the main tuning dial will tune approximately 5kHz in one revolution (360 degree rotation) instead of the usual 10 kHz.

For those amateurs that belong to MARS and operate on frequencies just outside the regular amateur bands, the '930 can handle this assignment very well. Locate integrated circuits IC-11, 12, 21, 22, 23 and 24. Using #22 insulated solid tinned copper wire as jumpers, use the following chart to implement the transceiver transmit function over the full 3 to 30 MHz spectrum.

ADD JUMPERS

FROM	TO
IC 21 PIN 12	IC 11 PIN 9
IC 22 PIN 12	IC 12 PIN 9
IC 23 PIN 12 *	IC 24 PIN 8

* Should you wish to make the new WARC bands operational only (transmit and receive), all that is required is to add the one jumper from IC 23 to IC 24 as shown on the above chart. Solder the jumper wires to the IC pins on the underside of the board.

For the implementation of the memory scanning function and the eight additional memories, additional wires must be connected from the digital board to other areas of the transceiver. Prepare two ten inch lengths of #22 stranded insulated hookup wire. Use two different colors for easy indentification. Solder one end of one of these wires to pin number five of socket seven. The other end of this wire will be connected to the function switch to make eight additional memory positions operational after the digital board has been reinstalled. One end of the other wire is soldered to pin number three of socket eight. The other end will be soldered to the dimmer switch as detailed later.

The changes to the digital board are now complete. Thoroughly check your work to insure that all connectors are well soldered and that the jumpers have been connected to the correct IC pins and board sockets. Reinstall the board in reverse order to the one in which it was initially removed.

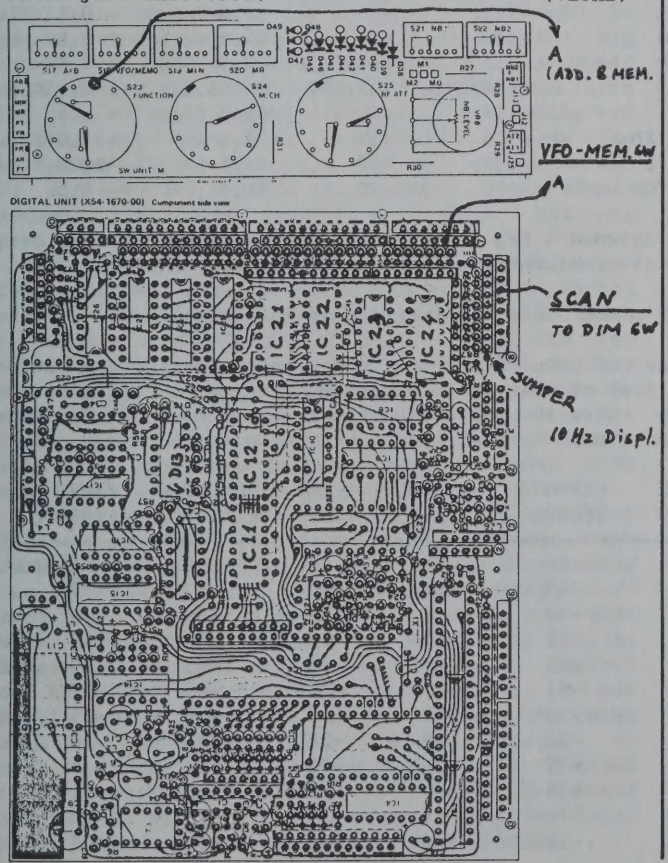
Once all the plugs have been mounted to their respective sockets and the board secured to the chassis, reinstall the speaker assembly over top the digital board and secure same with four self tapping screws. Dress the wire coming from digital board socket seven pin three to the function switch unit M. Trim the wire to length and solder the end to the topmost solder point of the function switch. Now, when the function switch is placed in the "B" position, eight additional memory positions are activated. Frequencies are stored exactly in the same manner as described in the TS-930S operating manual, except that the function switch "A" position now stores eight frequencies and the "B"

position allows storage of an additional eight frequencies. The flexibility of this change is apparent when operating on net frequencies or storing operating frequencies that are frequently used.

The last implements to be connected were those dealing with the memory scanning function. Since I operate my '930 with the dial lights in the dim position at all times, the front panel dim switch can be used for the memory scanning function. Disconnect the wires from the dim switch and permanently solder them together, such that the pilot lamps and frequency readout display are set to the "dim" position. Tape all soldered and unused leads. Dress and cut to length the remaining wire coming from the digital board (socket eight pin three). Solder the end of this wire to the center or movable contact of the dim switch. Solder another hookup wire from the outside contact of the dim switch to the nearest ground or chassis connection. Use an ohmmeter to identify the proper switch contact to use, such that when the dim switch is pushed in, the wire from the digital board is grounded. To start the scan function, make sure that the function switch is depressed, and change to the next ascending memory position every two seconds. While scanning you may switch into the "B" position to scan this bank of memories. Depressing the dim switch stops the scanning function.

Depending on your ability to work with printed circuit boards and complex electronic circuitry, the above changes should take no more than two to three hours of your time.

Now replace the top part of the '930 cabinet and secure it with the appropriate machine screws. Plug in the AC power cord, antenna transmission line, key and microphone, and enjoy the hidden treasures you've just uncovered. (VE3AZ)



EMERGENCY CREW PASSES TEST

About 1:30 AM on Friday, December 14, people on Dayton, Ohio's east side began to notice the strong odor of gas in the streets. Fire and police units were called, abut shortly after they arrived, a house blew up, becoming one large fireball.

Since no one knew where the gas was coming from or the extent of the leak, a decision was made to evacuate the area.

Ron Moorefield, W8ILC, was alerted to activate the Dayton Amateur Radio Association (DARA) emergency van, and Ray Smith, KR8B, the duty crew chief, was routed out of bed at 2:00 o'clock, and all personnel and equipment were on site in less than 40 minutes. Radio amateurs were assigned to the Fire Department, Red Cross and the Chief of the Miami Valley Disaster Service Agency.

The gas was detected over a wide area, so officials suspected multiple leaks. A command post was set up and 5 square blocks were eventually evacuated. This involved a home for the elderly, whose residents were moved to area hospitals. Buses moved local residents, many still in night clothes, to the Burkhart Community Center. The leak was finally found and the gas was shut off to the immediate area.

At 8:00 AM, the van was secured and the tired crew was released for home. DARA members involved in the emergency communications included KR8B, W8ILC, N8EHY, W8FPA, K8VAZ, KA8OKC and WB8WZR.

This first real test of the club's emergency van and its crews came through with flying colors. Ron Moorefield, W8ILC. (Westlink Report, January, 1985)

ARRL CONVENTION

Two top names in amateur radio will be making appearances at next August's ARRL Southwestern Division Convention, to be held aboard the Queen Mary ocean liner in Long Beach, California. Division Director Fried Heyn, WA6WZO, has announced that US Senator Barry M. Goldwater, K7UGA, will be the featured banquet speaker. NBC News Science Correspondent (and West Coast Deputy Bureau Chief) Roy Neal, K6DUE, will be the master of ceremonies. Several other surprises are also being planned. (Westlink Report, January 11, 1985)

WIA WORLD MEMBERSHIP

The Wireless Institute of Australia - the world's oldest radio society - has opened its membership to those living outside Australia. Already a number of Radio Amateurs in the US, UK, Middle East, Southeast Asia, New Zealand, Papua New Guinea and Oceania have joined the WIA, which celebrates its 75th Anniversary in 1985. A number of special events are planned for WIA 75. Overseas members are entitled to qualify for WIA awards, including the Australian DXCC, and have unlimited use of the free QSL bureaux run by the WIA in VK3. All members receive a copy of the WIA's monthly magazine "Amateur Radio," which is in its 52nd year of publication. Annual membership during 1985 is $39 (Australian) which should be sent to the Secretary, Wireless Institute of Australia, Victorian Division, 412 Brunswick Street, Fitzroy, 3065, Australia. (WIA News Release)

THIRD ORDER INTERMODULATION DISTORTION

KEN FARVER, KB9I

Through the years we have seen a lot of receivers tested for IMD.

With today's phase lock loop radios, we are seeing the noise from the loop interfering with our measurements. We never reach the point where the intermods really occur. When we test one radio at 20 kHz spacing and another at 100 kHz, the results are really meaningless.

Let's look at a new procedure. Instead of having as our reference the noise floor or MDS (3dB above the noise floor), let's come up to one microvolt, about S1 on most receivers. Think back to how often you hear a signal below S1. Most of the time atmospheric noise will keep you above that.

For the testing, first I'll measure the minimum discernible signal on 20 meters in the receiver's normal SSB bandwidth. A radio with 2.1 kHz bandwidth should have a better MDS than one with 2.7 kHz bandwidth, but I cannot control that.

I will have two generators of equal output, one at 14040 kHz and the other at 14060 kHz. I will have a hybrid combiner, step attenuator, and VTVM with a dB scale. I feed a signal of one microvolt into the receiver and set the VTVM for 0 dB at the audio output of the receiver with AGC off if possible.

Now I look at either 14020 or 14080 KHz for the intermods. I bring up the level of the generators by reducing attenuation until I see intermods equalling one microvolt observed by the VTVM again reading "0."

Now I have the level at which intermods equalled one microvolt and can calculate the third order intercept point. This intercept point is a figure that shows the maximum signal a receiver will be able to handle while keeping intermods "X" dB below.

I can also calculate the IMD Dynamic Range which is referenced to the MDS.

Changing the bandwidth will only change the dynamic range figure because the IM level and the intercept point will still be the same. Only the MDS will change.

Here is an example of how to obtain the figures:

MDS = -123 dBm
IM level = -21 dBm
Reference = -107 dBm

IMD Dynamic Range = 2/3 (Intercept - Noise Floor)

For the enclosed chart, remember which figures are better.

MDS	more negative	-136 better than -130
IM level	more positive	- 22 better than - 33
3rd order	more positive	+ 20 better than + 1

This is just a sample of one radio of each brand and differences may occur that I cannot be responsible for. Send all comments to me directly, please!

RADIO		20 m MDS	IM Level	IMD DR	3rd Ord.Int.
COLLINS	75S3	-133 dBm	-36 dBm	88.3 dB	- 0.5
	KWM380	-124	-20	98.3	+23.5
DRAKE	R4C (1)	-132	-26	97.6	+14.5
	TR7	-129	-27	94.6	+13.0
ICOM	740	-136/-130	-31/-26	96.0	+ 7/+14
	730	-136/-130	-31/-26	96.0	+ 7/+14
JRC NRD	515	-133	-31	93.3	+ 7.0
KENWOOD	930	-132	-36	87.6	- 0.5
	930	-132	-29	94.6	+10.0
	830	-136	-37	89.3	- 2.0
	820	-133	-48	76.3	-18.5
	520	-133	-40	84.3	- 6.5
	430 (2)	-134	-41	84.0	- 8.0
	130	-133	-43	81.3	-11.0
SIGNAL ONE 1030		-128	-21	100.0	+22.0
TEN TEC CORSAIR		-130/-120	-33/-22	92.0	+ 4/+19
YAESU FT ONE		-128	-36	85.0	- 0.5
	980	-133	-30	94.3	+ 8.5
	980	-133	-42	82.3	- 9.5
	102	-134/-123	-33/-22	92/95.6	+ 4/+20.5
	901	-131	-40	83.0	- 6.5
	101ZD	-134	-43	82.0	-11.0
	101E	-135	-57	68.6	-32.0
	757GX	-130	-30	92.3	+ 8.5

NOTES: (1) Sherwood 5 KHz first IF filter installed.
(2) Filter blow-by occurred before intermods.

Note two 930's and 980's, differences in alignment?

For those of you that are concerned about phase noise occurring, look at this table of recent receivers. Level in dBm required to raise the noise floor by three dB for "X" KHz away from the generator.

KHz	YAESU FT102	KENWOOD TS930S	KENWOOD TS430S	ICOM 740	MIL SPEC 1030	YAESU FT980
3	-42	-56	-70	-66	-50	-74 dBm
5	-37	-49	-64	-60	-47	-72
10	-29	-42	-56	-55	-39	-62
15	-25	-37	-51	-37	-33	-55
20	-25	-35	-47	-43	-42	-50
25	-21	-31	-47	-33	-27	-47
30	-20	-30	-47	-39	-26	-44
40	-18	-25	-36	-28	-23	-40
50	-17	-22	-36	-35	-21	-38
75	-16	-18	-30	-22	-18	-31
100	-14	-16	-26	-43	-16	-26
200	-14	-12	-20	-32	-10	-17

GOING ALL OUT

FOR THE PENNSYLVANIA QSO PARTY

JOHN GETZ, AD8J/3

I had been telling myself for months that this was going to be my year to go all out in the Pennsylvania QSO Party competition and maybe even win. I decided to do everything right so I wouldn't have any excuses for not having a respectable score.

I started several months before the contest, making plans and getting everything ready. During the summer I had gone over the antennas and got them in good shape. The TH7DX was on top of a 60' freshly painted tower; there were inverted Vees for 75 and 80 meters; and 40 meter slopers going SW and NE. The TS-930S was sporting a new set of Fox Tango SSB filters and the dust was cleaned out of the SB-220. In addition, plans were made to send the XYL out of town for the weekend.

The week before the contest I made sure that the lawn was cut, the garden was cleaned up for the winter, and all the chores were done around the house. I told my boss that I would be unavailable all weekend and not to try to call me.

The evening before the contest, the XYL left to visit her sister. She had instructions not to return until after the contest. That night I numbered all the logs, prepared the checksheets, worked up a rate sheet, and straightened up the shack in preparation for the start of the contest the next morning.

State QSO parties usually require a lot of quick band changes. The morning of the contest I marked all the controls on the SB-220 so it could be quickly tuned for each band. I made myself a big brunch and made sure that the meals that I would need during the contest were all ready to go into the oven. I couldn't believe it, but everything was working out just like it should. I took the telephone off the hook. All that was left to do was to sit down and operate the contest. That almost seemed like the easy part, after all my preparation.

My contest strategy was to open up on 20 meter SSB with the beam on Europe and to work a string of DX. You might think that this was a dumb thing to do in a state QSO party, but it has worked for me in the past. The problem with the smaller contests is that you tend to run out of stations to work near the end of the contest. If you can work a large number of DX stations during the contest you will find that this tends to result in more QSOs near the end of the contest period.

The contest started at 1600Z and I opened up on 20 meters. In the first 25 minutes, I had only worked eight stations! To make matters worse, only two of them were DX. Something was wrong, very wrong. I decided to switch to 40 SSB to see what would happen. As I reached for the antenna switch, I realized what was wrong: I was trying to operate on 20 meters with the 40 meter SW sloper. I was really mad at myself. It was getting too late to go back to the original plan of working Europe, as most of Europe was already in darkness. I decided to go to work on 40 meters. In the next 30 minutes I worked 54 stations, to give me 62 QSOs the first hour. I was starting to feel a little better.

For the next several hours I made it a habit to switch bands or modes every 20 minutes or so. This procedure accomplished several things. It allowed me to work the stations that were only around for a short while on several bands and modes. It also helped to establish my call on the bands as one of the "big guns." In my opinion, this is important, as stations will go out of their way to give you additional contacts on other bands. Some will even call in the XYL or harmonic to give you an extra QSO if they know that you are "going all out." It also helps you pick up the out-of-state multipliers as the changing band conditions put your signal in to different parts of the country.

As darkness fell on Western Pennsylvania, it was time to run 75 and 80 meters. I would work 80 CW (QSOs on 80 counted double) until things slowed down and then QSY to 75 SSB until that slowed down. This switching back and forth worked out quite well and resulted in 505 QSOs by 0300Z.

At 0300Z my trouble began. It had been suggested that at 0300Z everyone should try 160 meters. I dumped the SB-220 out of the line, kicked in the antenna tuner on the TS-930S, and attempted to tune up on 160. Murphy had struck again as the tuner wouldn't tune. I noticed that the lights on the control box for the remote antenna switch were out. This could mean big trouble as all the antennas are fed with the same piece of Andrews 1/2" hardline and switched with the remote antenna switch on top of the tower. I removed the cover from the control box and replaced a blown fuse. I now had the indicator lights working but still couldn't switch antennas. I was lucky, as the remote switch on the tower was stuck in the 75 meter position, which allowed me to hang out on 75 and 80 meter (what's a 5 to 1 SWR when you're "going all out") until the break at 0500Z. I had now worked 589 stations.

At 0500Z (remember this is 1:00 AM) it was into the kitchen for a quick snack, strap on the climbing belt, and zip up the tower to work on the switch. It took some work to free the rusted bolts, but I managed to remove the defective control box and take it down into the shack. It turned out that the 75 meter switch contacts had arced and stuck together. It didn't take much to unstick the switch and put the box back together. The hard work was taking the box back up the tower and reconnecting the control wires in the dark. Yes, I had a flashlight but I didn't have any batteries!

0700Z: The "Big Gun" was asleep.

The contest started again at 1300z and there were only nine hours to the finish. I tried to spend some time on 15 meters to finish up the multipliers from the west coast. This worked out OK but it didn't result in as many QSOs per hour as you could make on 40 meters. When I had worked as many of these Western multipliers as I could, I went back to my band switching mode again. In addition to switching bands and modes, I also had to switch between calling stations and calling CQ. The first day I had made most of my contacts by calling CQ. The second day I had to tune around and call those stations that only called CQ. As it

turned out, there were a lot of mobiles out running around and it was necessary to rework them each time they changed counties.

With only two hours left in the contest, things were looking quite good. I already had 865 QSOs and had 65 of the 67 Pennsylvania counties, plus 66 of the 74 ARRL sections. It would have been nice to work all 67 counties as a "special award" was being offered to the first person to accomplish that feat.

There were only five minutes left in the contest when I was called by W3HDH/M in Union County, which was one of the two counties that I still needed. This was getting exciting. Could I find a station in Cameron County in the last five minutes of the contest and make a "clean sweep"? I had been tuning the bands for the last nine hours, so I knew that there wasn't a Cameron County station active in the contest. I didn't know what else to do so I called "CQ Cameron County Pennsylvania" for the last few minutes of the QSO party. As you have probably guessed, there was no answer. "I don't think there is anyone there."

The XYL returned home thirty minutes after the end of the contest. She had a great time visiting her sister in Cameron County! (AD8J/3)

OSCAR ON US STAMPS

Dr. Norm Chalfin, K6PGX, is looking for support in persuading the US Postal Service to commemorate amateur radio's achievement in space. Excerpting form Worldradio News: "The first OSCAR was launched on 12 December, 1961. Since that time, an additional 20 amateur satellites have been lifted into space by amateur radio organizations around the world. December 12, 1986 will be the 25th anniversary of this milestone in amateur radio history. It should be commemorated. What better way...than for the US Postal Service to issue a commemorative postal stamp?" Norm suggests that we can help bring this about by writing a letter to the US Postal Service, attention the Citizens' Advisory Committee on Commemorative Stamp Issues, Washington, DC 20260. In your letter, you should comment that you would like to see a series of commemorative stamps issued to celebrate the 25th anniversary of the first launching into space of an Amateur Radio Communications Satellite. This project will only succeed if enough of us get involved. Tnx K6PGX and Worldradio News.

(Westlink Report, January, 1985)

HAM: MAYOR OF PALOS VERDES

The Rancho Palos Verdes City Council has elected John C. McTaggart, WD6GBG, as that city's mayor, marking the first time a radio amateur has held that post. Mayor McTaggart is a member of the Palos Verdes Amateur Radio Club, a group that has become very politically active as a method of fighting certain zoning and antenna ordinances.

Other members of that club who are active in local politics include City Councilman Melvin W. Highs, K6KSY; Planning Commission Chairman Dick Miller, WA6LML; and unlicensed PVARC member Robert E. Ryan, who has served twice as mayor in the past 10 years.

Newly elected WD6GBG has served on the city's planning commission since the city incorporated about a decade ago. Tnx WA6HXM. (Westlink Report)

DAYTON AIR FARE DISCOUNTS

FRED MAIA, W5YI, has arranged for a 35% discount of the normal coach fare for any individual attending the 1985 Dayton Hamvention. The arrangement was made with Piedmont Airlines, and reservations can be made by calling (800) 334-8644 and asking to speak with Ellie Goforth. You must state that you are calling in relation to the "W5YI Hamvention Special" fare structure. This arrangement is only available with Piedmont Airlines, and is apparently not applicable to already-discounted fares such as "super saver" or similar classes of travel, according to a Piedmont spokesman. (Westlink Report, January, 1985)

MYSTERIOUS SATELLITE

Is someone out there watching us? A mystery satellite has been heard on the lower end of the 2300-2450 MHz amateur band W4HHK and WA4HGN of Tennesee, using 18 and 28-foot diameter dishes. Both report copying a steady carrier with a marked Doppler Shift on 2301 MHz on October 5. The signal was 20-30 dB above the noise. In other news about the 2300-2450 MHz band, on November 8, the FCC took US amateurs off the 2310-2390 MHz portion of that band. The frequencies will now be used exclusively for aeronautical flight telemetry.

(CRRL NEWS, November 20)

The "Mystery Satellite" that has been tearing up the moon bounce folks on 13 cm has been identified. According to Dick Flagg, a member of the Kettering Group (a small satellite interest group with members around the world), the mystery satellite is not one, but two new Russian early warning satellites. Since the 13 cm band is allocated to radiolocation primary and amateur secondary, there is little that can be done about the intruders. On the other hand, the predictability of their orbits suggest their use to radio amateurs as beacons. Others involved in tracking down the new sputniks include W4HHK and W5LUA. Tnx Amateur Satellite Report. (Westlink Report, January, 1985)

NEW CRRL DIRECTORS

The CRRL Committee of Tellers met in London, Ontario, on November 20 to count ballots in elections just completed for CRRL Regional Directors. The number of votes credited to each candidate was as follows. Atlantic Region: Andrew McLellan, VE1ASJ, 162, and Ronald Hesler, VE1SH, 71. Ontario Region: Raymond Perrin, VE3FN, 643, and William Loucks, VE3AR, 360. Prairies Region: William Gillespie, VE6ABC, 260, Bert Anderson, VE4AP, 132, and John Gwron, VE4ADS, 55. Andrew McLellan, Raymond Perrin and William Gillespie were declared elected. Candidates previously declared elected were Quebec Region: Albert Daemen, VE2IJ, and Western Region: William Kremer, VE7CSD. All begin new two-year terms of office on January 1.

(AR HR Bulletin 39 from CRRL)

Congratulations to Andy, VE1ASJ! Well deserved.

DX SPOTTING REPEATERS

BILL PASTERNAK, WA6ITF

Anyone who lives in a community where a DX spotting repeater exists will tell you that they are a mixed blessing. On the one hand, they give all interested DXers and contesters a place to "keep an ear tuned" for the latest information on what "rare one" may be making an unexpected appearance. On the other hand, they are still repeaters, and therefore suffer from the pitfalls of all such machines. Users. Not the regular crew, mind you, but rather the incessant chatter of those "passers by" who find your DX info channel an ideal place to exchange the latest information on arthritis remedies or recipe for chocolate cream pie.

Some DX clubs who sponsor "Spotting Machines" have taken to making them tone-access, with the required access tone available only to the members of the club. That subterfuge worked for about a year until those fine "5th generation" 2 meter FM sets came along, complete with built-in CTCSS tone generators. There were "ma and pa" again, talking about arthritis medications, as your nerves began to frazzle. Well, there are always special "non-standard" tones that can be used, but I am willing to bet that the "Rice Box" generation 6 will include a dandy little "seek and destroy device" that will have the ability to listen to a given tone and then regenerate it, no matter how complex. It will even be digital.

Ah, but there is an alternative, and one that is really in line with solving a number of problems. There is a place in the RF spectrum where you can put up a new "DX Spotting Machine" or relocate an existing one, and not have it "overutilized" for purposes other than those intended. I speak of 220 MHz.

As some of you might know, for many years I wrote the FM and Repeater column for 73 Magazine. It was titled "looking West" and chronicled the emergence of what Wayne S. Green, W2NSD, dubbed the "Fun Mode." What you may not be aware of is that from the mid-1960's on I was involved in another facet of VHF FM repeaters: that of voluntary coordination of such machines, on two sides of the nation. I will not say that I am any sort of expert on the subject, but I do know the pitfalls of repeaters and all aspects of their operation. The main thing I can tell you is that "special interest systems," such as those used for DX contact spotting, definitely do not belong on 2 meters in crowded urban areas.

Two meters is the "people's band," and when you get into big cities, the masses want it all. By "all" I mean an open, wide coverage system, accessible 24 hours a day on every 15 kHz channel. They want these boxes for the singular purpose of to coin a well-worn CB phrase, "ratchet jawling." Two meters might have been a good choice for the establishment of such special interest machines about 15 years ago. However, the problems inherent to that band and its massive overcrowding make a relatively quiet channel, as necessitated for DX Spotting operation, a prime target for either "close-proximity coordinated co-channeling," or for an uncoordinated "pirate box." Many times, the latter shows up just because the channel is "clear" and some technically incompetent individual with a fat wallet and ego to match has the bucks to buy a repeater and antenna. Problems like this, once peculiar to environs such as New York, Los Angeles and the like, are now rearing their collective heads in smaller communities as well. So, as the man says, maybe now it's time for a change.

The 220 MHz, or 1 1/4 meter band, is the ideal place today to establish special interest operations. With the exception, perhaps, of Southern California, there is still ample room on that band nationwide to establish new and dedicated systems for just about any purpose. Unlike 2 meters, nobody will complain that your small special interest group is using up "valuable space" for very limited interest. As you know, the average ham cares little that a "UA0 may be on 40 CW with a 438 report." (I've met a number of hams who cannot even read the CW-ID on a repeater and have to ask someone the system call. So much for testing standards). On the other hand, the 220 band welcomes you with open arms. In fact, if DXers were to act fast enough, a national network of DX Spotting Systems could easily be established on a single channel pair on the 1.25 meter band. This would be of benefit to every DXer and contester, because they would know where to look for "DX info" regardless of where in the nation they might be. It would also give the added "bonus" of helping to populate a band that sorely needs more people to use it.

There is no doubt in my mind that DX Spotting Repeaters serve a definite and important purpose, but I tend to frown on the concept of "keeping the masses out" so that a select few can play. Two meters may be the most popular of our VHF bands, but it's this popularity that works to the detriment of small special interests. While it will mean investing in another rig so as to monitor a 220 box, that's a small price for the dedicated DXer or contester to pay for the ability to have an uncluttered "clear channel" system that is to be depended upon for DX info, night and day. If enough DX interests were to move onto 220 for this purpose, it might be feasible to have some given channel pair declared as "National DX Spotting Relay Channel," similarly to several 2 meter channels now holding that same declaration for RTTY or other interests.

With some small exceptions, most DX organizations were latecomers to the 2 meter repeater scene. As a result they have been forced to take extraordinary actions to keep their systems clear, or what most hams call "normal traffic," so as to use these repeaters for their main purpose, the dissemination of DX and contest info. A by-product of this is having to get involved in the 2 meter "political nightmare" that many coordinators and coordination councils place new applicants under.

As someone who has watched "repeaters with a purpose" mature, as opposed to the "gab and grunt" variety, I have noted that the special interest groups survive and prosper best when well detached from the mainstream of activity. DX Spotting is a special interest, and can best be served under the same conditions. The 220 MHz band is literally the "land of promise" for those willing to pioneer it. It's uncrowded, holds with a nationally unified bandplan, and exhibits the same propagation characteristics as the 2 meter, for the most part. Best of all, there is now a plethora of gear available for it, at prices competitive with similar equipment for 2 meters. This makes it the obvious solution to the ever expanding need for more and new DX Spotting systems. It's a band that I highly recommend for this purpose.

The Low Band DXers Pledge of Allegiance

Mike Crabtree, AB0X

If you want to be a low band DXer, place your left hand on your Alpha, raise your right hand and repeat after me:

I,(insert your call),pledge allegiance solely to the low bands, forsaking all other frequencies, in my never-ending quest for DX, with full knowledge that I will forfeit all aspects of a normal life. Therefore, I will forsake any sort of family life, regular sleeping hours, a normal sex life, and all other recreational activities or commitments that might interfere with low band DXing.

I also pledge to fill my back yard with as many wire, vertical and listening antennas as possible.

I accept the burden of never having enough radials in the ground, and I am fully aware that I will be perpetually burying wire in my yard as long as I am physically able.

I promise to disavow all guilt or wrongdoing when TVI complaints are received from my irate neighbors.

I further pledge to endanger my job on a regular basis as a result of countless hours of lost sleep spent tuning the low bands in the middle of the night.

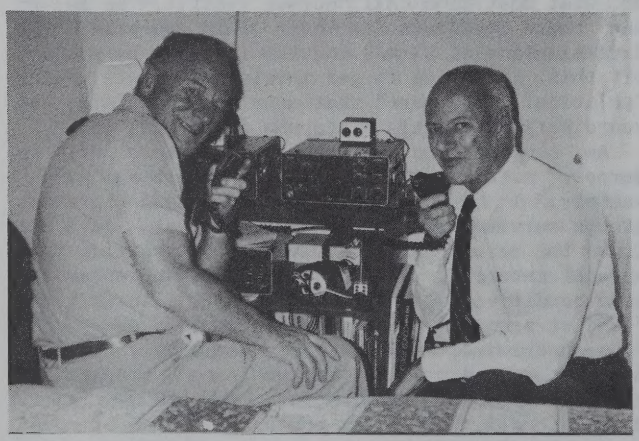
Lastly, I pledge to spend the rest of my amateur life listening to static and QRM and calling stations I can't hear!

Congratulations! You are now a Low Band DXer!!!

(reprinted from the Kansas City DX Club)

HAMVENTION AWARD NOMINATIONS

The nominating period for the 1985 Dayton "Ham of the Year," "Specific Achievement" and "Technical Excellence" awards is now open. These are the "Oscars" and "Emmys" of the amateur radio hobby. If you know of someone you believe deserves one of these awards, you are asked to send a detailed letter of nomination to Robert Rottele, W8UNV, Awards Committee, Dayton Hamvention, P.O. Box 44, Dayton, OH 45401. The nominating period closes April 1, 1985, and the winners will be announced on or before April 15. Tnx DARA. (Westlink Report January 11, 1985)



Ron Hodgson, G3DUW, (left) on holiday, enjoying cross band QSO on 20 meters with Ken Miller, K6IR, on 20 meters at the home of G3DUW's son, Richard, G4KBH/W6. K6IR frequently participates in contests

NOT THE CONTESTER'S CODE OF ETHICS

Bob Clarke, N1RC

The Contester is...

TRUSTWORTHY: He can be trusted to send in his logs if he knows that he has won.

LOYAL: He adheres to tried-and-true products such as Eimac and Alpha.

HELPFUL: He will quickly and courteously inform another ham that 'the frequency is in use.'

FRIENDLY: He will work any eligible station, especially those in remote corners of the earth.

COURTEOUS: He is always polite, especially to amateurs engaged in discussing porcine agriculture on 3830.

KIND: Whenever possible, he tries to warm the feet of birds perched on his antennas.

OBEDIENT: He always follows the manufacturer's guidelines for filament voltage and current in his high power tubes.

CHEERFUL: He enjoys winning contests and accepting awards.

THRIFTY: He obtains amplifier components as 'engineering samples.'

BRAVE: Neither snow, nor rain, nor dark of night will prevent him climbing his tower, especially if the beam is stuck pointing at JA during the morning European runs.

CLEAN: He bathes after contests. Sometimes.

REVERENT: He makes an annual pilgrimage to the shrines of Saints Alpha and Eimac, located in Dayton, Ohio.

(Reprinted form the YCCC "Scuttlebutt")

CONSUMER ALERT

Japanese domestic Yaesu FT-757 GX transceivers are starting to appear in the central US, according to Bob McKay, N8ADA, of the Dayton Amateur Radio Association. McKay told Westlink that these radios lack several features found in the US export model, including a CW filter and the ability to operate on the WARC bands. It must be stressed that these radios are not being imported into the US by Yaesu, but seem to be entering the country illegally through private, unknown sources. McKay notes that the manuals differ from those imported to the US by Yaesu, and that the cartons are clearly marked that the radio cannot be serviced in the United States. However, this latter information may be covered over on the shipping container to keep the prospective purchaser from being aware that he is buying "gray merchandise." Westlink will follow up on this story and will try to locate the source of the seemingly illegal imports. In the meantime, we suggest that you inspect very carefully any radio offered as a "bargain" at a swap meet, hamfest or other gathering. (Westlink Report, January, 1985)

THE NEXT SHUTTLE AND HAM MISSION

When Amateur Radio flies into space next on a shuttle mission, it will be a fairly complex operation. NASA has approved, "in principle", the idea of permitting another "ham in space" operation, sometime before the end of 1986. Before a final go ahead can be issued, there are many technical parameters that must be considered. In an attempt to clarify exactly where the manned "ham in space" program stands, Westlink telephoned two NASA radio amateurs who are deeply involved in the project at the Johnson Space Center in Houston, Texas. We spoke with Doug Ward, WA5SFY, in the JSC Public Relations Office, and Dick Fenner, W5AVI, who is a key man in the volunteer engineering team working on the project. Here is their analysis of where we stand and what to expect:

Currently there are two Spacelab missions planned for the 1985 fiscal year, both with licensed radio amateurs on board. (At this writing, NASA has not made any definite decision to "scrub" either of the two Spacelab missions in an attempt to get the US space transportation program back onto schedule. Currently, NASA is researching every avenue, but nothing final has been determined relating to the flight schedule.) This means that Dr. Owen Garriott, W5LFL, might again get a chance to operate from space, as will Dr. Tony England, WOORE, and John David Bartoe, W4NYZ. As we go to press, the exact role that will be played by Bartoe is still unknown. As for equipment and operation: if Dr. Garriott does operate again, he will probably use the same hand-held 2 meter FM transceiver that he used on STS-9. As far as a replacement for the window mounted antenna--that is still unknown.

First, the same type of battery powered hand-held 2 meter FM radio that Dr. Garriott used will be employed. If there are any major changes, they will be such things as a modification of the radio's squelch circuit, which was troublesome on STS-9. It performed flawlessly, and that was its major drawback! The reason that W5LFL had problems in receiving some of the stations calling him was because on the STS-9, the squelch was automatic; Dr. Garriott had no control over it.

Due to a new and rather sophisticated form of squelch circuit that used a comparator, combined with the high signal levels received that gave it nothing for comparison, W5LFL had trouble receiving. That is now being taken care of.

The other change is in regard to the antenna system, which will hopefully be mounted externally this time on the orbiter in the payload bay.

The second facet of this mission will be an automated/manual 2 meter uplink and 10 meter downlink. Here is where we get a bit more complex. The system, as conceived, involves both voice and slow scan ATV.

First, on the uplink, will be a 2 meter "stepping" receiver which will listen across its passband in specific frequency and time increments. Anything it hears will be relayed or "repeated" back to earth on the 10 meter downlink, which will be transmitting FM. FM is being used because of the doppler shift problem associated with amplitude modulated transmission modes. The well known "capture effect" of FM is extremely important when you consider that you are dealing with an object traveling forward with a velocity in excess of 17,000 mph. Those who have operated through the early OSCAR satellites are well aware of the problems created by doppler shift. The wider bandwidth and capture effect inherent with FM tend to minimize this problem.

Another unique aspect of the 10 meter operation will be the ability to retransmit slow scan ATV from several sources. Slow scan was chosen for a few reasons. First, fast scan is not legal on 10 meters, though an STA might have been obtained. Aside form that, no single standard for fast scan television exists. The USA and Japan use a 525 line scanning system, while most of the rest of the world utilize a 625 line standard. With slow scan, no problem exists, since international standards exist.

The equipment on board the orbiter will transmit the standard 8 second monochrome frame or 12 second color frame options. All SSTV enthusiasts can receive these pictures.

For source material, the system aboard the shuttle will consist of a video switcher tied to a frame "grabber" or frame storer which has the ability to freeze a frame of a video signal. This stored information will then be fed to the 10 meter transmitter for normal slow scan ATV transmission.

The system, as now envisioned, will be able to receive a slow scan signal on the uplink and retransmit it, or be tied to cameras on board the spacecraft that the astronauts can use to show something specific in real time.

A side benefit of the 10 meter SSTV downlink is the ability it will afford non-hams to take an active part by using simple scan converters tied to home computers. All logging of received and transmitted signals will be done using audio cassette recorders, as was done during the flight of STS-9. This is the simplest and most fool-proof method of logging and makes life a lot easier for the astronaut/ham operators.

Antennas will have to be outside the interior of the cabin for this gear, and that is one of the feasibility studies going on right now. Other studies include evaluation of power requirements, EMI compatibility and space requirements. As pointed out by W5AVI, some of these evaluations will continue right up to the moment of launch.

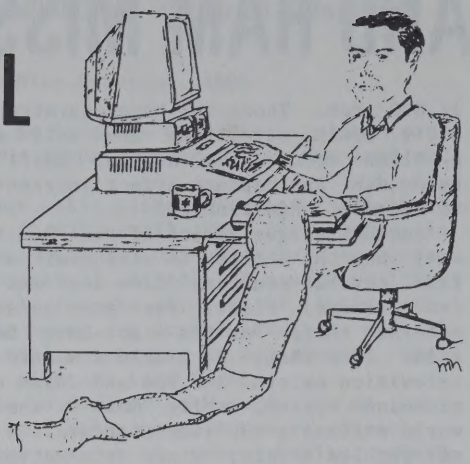
This leaves only one question: when will any or all of this take place? The best guess is sometime from mid summer to early fall for the England/Bartoe operation, and no guess at this time concerning another space "DXpedition" by W5LFL. Once the NASA reevaluation of its mission schedule is completed, it will announce the new dates. At the moment, all we have is a go ahead from NASA/Washington to continue planning, and a group of very dedicated hams at the Johnson Spaceflight Center and the Kennedy Space Center undertaking the tasks of flight compatibility, evaluation and equipment design.

In a way, the delay in the overall space shuttle program is working to the advantage of amateur radio, because it gives those very dedicated people more time to properly plan for a very successful next "ham in space" operation.

Westlink Report would like to thank WA5SFY, Doug; W5AVI, Dick; and K6DUE, Roy, for their help in the preparation of this report.

(WA6ITF, Westlink Report, #436, January 11, 1985)

ARRL CAC



Bob Nash, VE3KZ

This month I would like to present the ARRL Contest Advisory Committee as viewed from this foreign country to the north of the ARRL homeland. Each Division of the League has a representative on the committee, producing a nucleus numbering sixteen, plus a Board Liaison, Howard, W9KM, and a Staff Liaison, Mike, W1OD. The Chairman since last summer has been George, WOUA, who is also the Rocky Mountain Division representative.

Each ARRL Advisory Committee must go through its ups and downs. A couple of years ago, when I first joined, upon the artful advice of VE3OT (who then resigned as Canadian Director!), things were very active, with well over one hundred pieces of correspondence arriving during the year. AA2Z and aforementioned W9KM were Staff Liaison and Committee Chairman, respectively, and sure kept the pot boiling. By the end of the year a major vote was taken on the topics listed below.

- Separate categories for 'Guest Operators' - Rejected
- High band QRP ARRL DX category - Tie vote
- DC as a separate 'state' multiplier - Rejected
- Double CW points in 10M contest - Accepted
- KH6 & KL7 as states for ARRL DX - Rejected

I managed to vote with the southern boys except for the issue of the District of Columbia. It seemed to be an issue that was steeped in local politics, and I was happy to join the two like-minded US representatives in heartily approving it. From this perspective, it was a move that was long overdue. The number of operators, who they were, unfair advantages and other arguments seemed specious to those of us in the land of VO, VY1, PEI, zone 2 and VE8.

As you have no doubt heard, the ARRL has now decided to reject the Advisory Committee recommendation and made DC a separate multiplier 'state'. I wish I could say I'm now happy but I can't take any joy from having the decisions of my committee over-ridden. We seem to have been given two years to forget our decision, but it won't be that easy and the issue threatens to undermine the committee structure. Surely we're not going to let the details of local US politics cause the same grief with contesting that US international politics have caused in the realm of DXCC!

The issue of separate multiplier status for VY1 and VE8, two totally separate territories within Canada, was recently raised by VY1CW. For contests where states and provinces have traditionally been multipliers it seems only fair that VY1 should have their own multiplier status. It should also be mentioned that neighboring VE8 will become two territories in the forseeable future due to negotiations presently underway. The likely outcome will be one or two new prefixes and another new multiplier. I hope there are no US or Canadian political taboos attached to this issue!

During the last year or so, the CAC went awfully quiet during interim leadership and I'm pleased to see a resurrection of activity, perhaps aided by the controversy, but more likely caused by the new W1OD/W9KM/WOUA team. Those of us in the trenches appreciate this new direction under the trying conditions brought about by ARRL management. Those of us in the trenches would also like those letters to your Divisional rep., or to Mike, W1OD, who will propagate them to all members of the committee. We're looking forward to hearing from you on a little back-scatter! (VE3KZ)

1984 CAN–AM CONTEST TOP TEN

Single operator - Phone

K6LL	528515	VE3AXV	140919
AG7M	451881	XJ5GF	137865
KB6JK	286016	XK1QU	86700
W7FGT	194571	VE7AV	84312
KI6O	146584	XJ5ADA	81260
KOSCM	146160	VE4RP	65538
KB8PK	110220	XJ3OME	58520
KS7T	75225	VE7DLM	53361
K3GYD	68799	VE3CPU	47242
KE4UI	60600	XJ4AKN	45540

Single operator - CW

K6LL	195776	VE6OU	137241
N7CIX	84630	VE3DZV	101018
W7FGT	83853	VE3OME	44160
NA9J	78652	VE7AV	28620
AG7M	66126	VO1AW	27714
KS7T	64792	VEOMJN	25560
W5ASP	59752	VE3NBE	24165
W7TC	49728	VE3KOY	21801
K8NVT/1	40827	VE3ST	18315
KW2J	35409	VE7DVV	15180

Multi operator - Phone

AA5B	322056
K5QHD	157480
KK9G	58266
VE8RCS	40095
W8YY	4680

Multi operator - CW

AA5B	185040
KBOG	153408
WD4IIO	21912

For the complete results and story on 1984 CAN-AM contest see upcoming issues of QST. (VE3IY)

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

If you received RADIOSPORTING and are not subscriber, it was no accident. Please consider it an invitation to join.

TECH NEWS

Mike Spenuk, VE3JTQ

12-inch LCD Module with 640 x 200 Pixels

It looks like the engineers at Toshiba have done it again. They have developed a 12-inch Liquid Crystal Display (LCD) module with 640 x 200 pixels (picture elements). This development has definitely opened the coffin of the CRT monitor, for the module can display 25 to 80 character lines of alpha-numeric characters and graphics.

During the last few years, much progress has been made in LCD modules. Size (display capacity) and speed have continued to be improved upon. You no doubt know of Sony's "watchman" LCD TV. It appears that the "hang-on-the-wall" TV set can't be too far off; but speed and color need to be dealt with before the infamous "one-eyed monsters" become museum pieces.

The newly developed display has a 12-inch diagonal flat display area, a separate video signal CRT interface circuit, and an aspect ratio similar to CRT's. The display area is 252(W)x191(H) mm. The dot size is 0.33(W)x0.812(H) mm; dot spacing is 0.05(W)x0.1(H) mm; number of dots: 640 (horizontal) x 200 (vertical), divided into two blocks which are electrically isolated (i.e., upper 640x100 and lower). The number of characters is 80 x 25 (2000) in an 8 x 8 dot format. Overall dimensions are 274.8(W) x 240.6(H) x 24.0(D) mm; weight is 800 g.

The LCD display has a contrast ratio of 7:1 (at a viewing angle of about 28 degrees). The typical response time is 250 mS at 25 degrees C.

As you can imagine, the most difficult problem in developing LCD displays is achieving good optical characteristics and display uniformity, and having a response time as fast as possible. According to Kawasaki in his article (see Reference note below), new technologies had to be developed to solve the problem. For example, it was found after thorough research that the usually grey background in LCD displays should be changed to green (with black characters) to obtain "effective recognition."

Additional solutions to the problem are outlined in Kawasaki's article, and there is an overview of the system construction and interface timing. A comparison of the 12-inch LCD module to a standard 12-inch CRT monitor is also made. The most significant observations (differences) occur in weight (800 g vs 5600 g for the CRT); power supply requirements (operating voltage: 16 p-p vs 5kV); power consumption (1W (includes interface circuit board) vs 12W); and life expectancy (50 kHrs vs 20 kHrs).

The only place where the CRT still wins out is in the optical department: contrast ratio of 1:7 for the LCD vs 1:10 to 20 typically for the CRT; response time: typically 0.1mS vs 250mS for the LCD.

The 12-inch LCD display is indeed a welcome "invention." Unless you are a super-fast typist and compose on the screen, the slow response time shouldn't be a bother. Considering the space-saving features and low power consumption, this module should make all those that turn hotel rooms into "instant offices" happy. Also, here's the solution for contest-peditioners who don't like to manually dupe!

(Reference: K.Kawasaki et al, "12-inch LCD Module with 640 x 200 Pixels", I.E.E.E. Transactions on Consumer Electronics, Vol. CE-30, No.4, Nov.1984, pps 556,561.)

Microchip Research G-style

British Telecom's Research Laboratories are involved in 14 projects which have been awarded 21 million pounds by the Alvey Directorate as part of its program to promote new microchip technology.

The Alvey program is a joint venture between United Kingdom industry and government. It involves the Department of Trade and Industry, The Ministry of Defence and the Science and Engineering Research Council.

In five of these projects, worth 10.6 million pounds, the Research Laboratories are acting as lead contractor.

The awards are for cooperative projects in the section of the Alvey program devoted to very large scale integration (VLSI). This aims at establishing the technology required for the next generation of silicon integrated circuits.

The overall program has been designed to research the new materials and processing techniques needed to reduce the size of individual components in integrated circuits and to develop advanced techniques for their inter-connection on the chip.

As a result, the integrated circuits of the future will contain new materials in layers and line widths up to ten times smaller than present.

This will not only allow up to one million components to be fabricated on one chip, but also increase device operating speed.

Dry etch:

of integrated circuits becomes essential with pattern dimensions less than three micrometers. The project is intended to improve dry etching techniques and apply them to new materials likely to be used in VLSI devices.

Electron beam resist development:

electron beam lithography is more suitable than optical methods for printing the fine line patterns of VLSI. The surface of a silicon substrate is scanned by a beam of electrons under computer control. This exposes the required pattern in a layer of electron sensitive resist, which is then used as an etch mask for defining a relief image in the substrate. The project will lead to more sensitive resists, giving shorter writing times and finer patterns.

Failure analysis using scanning microscopy:

The next generation of VLSI circuits to be developed under the Alvey program will be too complex for present-day methods of locating and analyzing faults. Their circuit elements will be too small for mechanical probing to pin-point failure sites, and because these sites may occur in any of several sub-surface layers, optical and electron microscopy will no longer be sufficient for identifying the failure mechanism. Work will now start on using other recently developed

techniques, such as scanning electron, and accoustic microscopy.

High resolution analysis:
research carried out under this project will be aimed at improving current methods -and developing new techniques- for analyzing the chemical composition of the new materials and fine line structures of the next generation of VLSI devices.

Multilevel interconnect:
in present-day integrated circuits, individual transistors on each chip are interconnected by patterns of metal tracks, which, on comparatively coarse patterns, can be created from a single layer. Reducing transistor dimensions makes single-layer track routings more complex, eventually limiting the number of transistors which can be placed on the chip. Two or more layers, separated by insulating material, simplify track lay-out and reduce the chip area required for a circuit of given complexity. Under this project, British Telecom and its partners should develop multilevel technologies leading to simpler designs and enhanced performance. (ITU TELECOMMUNICATION JOURNAL)

From Hughes Aircraft Company comes the following:
-After slowing from 107,000 miles per hour to subsonic speeds in just two minutes, NASA's Project Galileo Probe will take the first direct samplings of Jupiter's atmosphere later this decade. During its plunge through the brightly colored clouds, much of the Hughes-built probe's forward heat shield will be eroded by temperatures of several thousand degrees. Once the probe has slowed, a mortar in the rear heat shield will fire to deploy a parachute. This parachute will pull off the back cover, releasing in turn the main parachute. Small explosives will release the front heat shield from the descent module. The parachute will slow the descent as the shield continues into the interior of the planet. Data will be transmitted to an orbiting spacecraft for relay to Earth. Project Galileo is set for launch in May 1986 and is scheduled to arrive in August 1988.

-An experimental search-and-rescue transponder will be carried on two weather satellites now being built for launch later in this decade. The two Geostationary Operational Environmental Satellites (GOES) ordered by NASA from Hughes will be able to receive and relay distress signals from automatic emergency transmitters carried aboard long-range aircraft and ocean-going vessels. The transponder will locate distress calls from any activated beacon within the satellite's coverage. With two satellites, this area encompasses nearly all of North and South America and most of the Pacific and Atlantic ocean basins.

-The first US facility for making gallium arsenide solar cells on a standard production line is now under construction at Spectrolab Inc., a Hughes subsidiary. Gallium arsenide cells, which are now being made on a prototype line at Hughes Research Laboratories, will help satellites and spacecraft become more efficient in converting sunlight into electricity. Compared to conventional silicon cells, gallium arsenide cells generate up to 30 percent more power and operate at much higher temperatures. The first cells are expected to come off the production line in mid-1985. Full-scale mass production at rates to 15,000 cells per year is scheduled for January 1986.

AWARDS

Mike Spenuk
VE3JTQ

I became a DX chaser within days of signing on the air for the first time. After a dozen or so stateside contacts, which were quite gratifying for a new ham, I worked my first DX: WA6QFO/3D6. My CW was not great; I was very nervous; I only copied bits and pieces of the QSO. Swaziland was interpreted as Switzerland! I was so happy; my first Eu QSO! After a number of minutes and Jerri's insisting that the QTH was in South Africa, I was still on cloud nine.

Later, after looking through the callbook, I discovered that 3D6 was quite rare. A DXer was born.

That first DX QSO was some seven years ago. Today, the DXCC total is around 280, mostly CW but not all confirmed. I haven't even bothered to apply for DXCC. I am not a person that needs to prove to anyone that I worked these guys; I know I did. But many others like the paper on the wall.

Throughout this DX chasing business, one discovers that the countries being worked are only in a certain part of the world. Why? After some time, this reason occured to me: I was operating at the same time of day whenever I was on the air. I became tired of receiving 100 YU cards from the bureau every month so I changed my operating time. That wasn't such a great idea. Now I'm getting 100 JA cards a month!

To sum up, I discovered this thing called "propagation," and in time I could work anywhere I wanted to. The DXCC totals rose and I discovered the WAZ (Worked All Zones) and the WPX (Worked All Prefixes) awards.

The world is divided into 40 zones (by CQ) and 75 zones (by the I.T.U.). These zones are based on geographical locations/divisions which are usually country boundaries, or in the case of large countries, the country contains more than one zone. In most cases the divisions follow the call area divisions in the large countries. The callbook contains a WAZ map which is easier to use than to list the zones here.

The WAZ award is offered for phone/CW contacts on 80 through 10 m (I don't know about the WARC-79 bands), single-band and single-mode, and 5-band WAZ. Here are the rules for regular WAZ.

WAZ RULES

The WAZ award will be issued to any licensed amateur station presenting proof of contact with the 40 zones of the world. This proof shall consist of proper QSL cards which may be checked by any of the authorized CQ checkpoints or sent directly to the WAZ Award Manager, Mr. Leo Haijsman, W4KA, 1044

Southeast 43rd St., Cape Coral, FL 33904. Many of the major DX clubs in the US and Canada and most national amateur radio societies abroad are authorized CQ checkpoints. If in doubt, consult the WAZ Award Manager. Any legal type of emission may be used providing communication was established after November 15, 1945.

1. The official CQ WAZ Zone Map and the zone list (available from CQ Magazine) will be used in determining the zone in which a station is located.

2. Confirmation must be accompanied by a list of claimed zones showing the call letters of each station contacted within a zone. The list should also clearly show the applicant's name, call letters and complete mailing address.

3. All contacts must be made with licensed, land based, amateur stations operating in authorized amateur bands.

4. All contacts submitted by the applicant must be made from within the same country. It is recommended that each QSL clearly show the station's zone number. When the applicant submits cards for multiple call signs evidence should also be provided to show that he or she held those call letters.

5. Any altered or forged confirmations will result in permanent disqualification of the applicant.

6. Include with the application a $4 processing fee ($10 for non-subcribers) plus a self-addressed envelope with sufficient postage stamps or international reply coupons to return the QSL cards by the class of mail service desired and indicated. International reply coupons equal in redemption value to the appropriate fee are acceptable. Checks should be made out to Mr. Leo Haijsman, WAZ Award Manager.

7. In addition to the conventional certificate for which any and all bands and modes may be used, specially endorsed and numbered certificates are available for phone and single sideband operation. The phone certificate requires that all contacts be two-way phone and the s.s.b. certificate requires that all contacts be two-way s.s.b.

8. If, at the time of the original application, a note is made pertaining to the possibility of a subsequent application for an endorsement or special certificate, only the missing confirmations required for that endorsement need be submitted with the later application, provided a copy of the original authorization signed by the WAZ manager is enclosed.

9. Decisions of the CQ DX Awards Advisory Committee on any matter pertaining to the administration of this award will be final.

10. All applications should be sent to the WAZ Award Manager or to CQ Magazine.

11. Zone maps, printed rules and application forms are available from the WAZ Award Manager or from CQ headquarters. Send a stamped, self-addressed envelope, 4 x 9.5 inches, with 37 cents postage, or a self-addressed envelope and 2 international reply coupons.

Any questions regarding areas will be answered on the basis of the zone map. For rulings on borderline areas, consult the WAZ Award Manager.

The WPX award is based on fairly straightforward rules (I don't have the rules at the moment but I will try to get them) Information concerning the WPX award should be sent to: CQ WPX AWARDS, P.O. Box 1351, Torrance, California 90505-0351, USA.

I have summarized information about the single-band WAZ award from 1978 forward. From this table, you can see which bands are popular and which are more difficult. I couldn't find any information on 160 m, which doesn't necessarily mean that no one has made WAZ on 160. An interesting observation is that only 40 m contains more CW activity than the phone; this is probably due to the split operation necessary on the phone.

The second table contains the top station listed on the WPX Honor Roll, with prefix totals (excluding deleted prefixes), and the number of CW and phone WAZ awards since 1977. You can see that this is the most popular WAZ, and the easiest to earn.

From this table, it is clear that YU7DX is a super op or something is wrong. K2VV and others have written to the editors of CQ stating just that. The difference between 1983 and 1984 totals seems to be quite out of line compared to the previous 6 years.

Finally, F9RM appears to be dedicated to staying on top of the phone Honor Roll. Congratulations! But remember that nothing lasts forever.

WAZ AWARDS AWARDED: Band-by-band breakdown (PH/CW)

YEAR	80	40	20	15	10
1985	26/na	28/50	515/225	207/112	285/ 53
1984	24/3	24/46	479/204	180/100	260/ 48
1983	na/na	22/38	427/180	149/ 80	223/ 42
1982	na/na	12/29	384/155	109/ 55	166/ na
1981	na/na	na/na	330/120	65/ 40	75/ 13
1980	6/na	2/14	261/ 88	29/ 19	28/ 6
1979	na/na	na/ 8	172/ 57	8/ na	2/ na
1978	na/na	na/ 3	65/ 28	na/ 2	na/ na

(na = not available)

WPX HONOR ROLL & CW/PH WAZ

YEAR	WAZ	MIXED	PHONE	CW
1984	5810	3216 YU7DX	2547 F9RM	2833 YU7DX
1983	5641	2522 F9RM	2438 F9RM	1895 W8RSW
1982	5430	2342 YU2DX	2244 F9RM	1835 W2NC
1981	5203	2154 F9RM	2066 F9RM	1640 W8KPL
1980	4919	1920 F9RM	1828 F9RM	1557 W8KPL
1979	4634	1805 W4WV	1650 F9RM	1482 W8KPL
1978	4346	1745 W4WV	1547 F9RM	1383 W8KPL
1977	4133	1675 W4WV	1443 F9RM	1312 W8KPL

(VE3JTQ)

Two DXers that are part of NJDXA hospitality suite in Dayton: Stan, W2MT (left) and Wil, W2MJ.

RTTY

Some Notes on the History of Teletype

Time and distance were conquered in 1844 when inventor Samuel Morse sent the first telegraph message. Early telegraphic communication took rigorous training for operators, and needed two to get a telegram over the wires. A system that could be received automatically in the form of typewritten or printed alphabet characters was needed, instead of a system of audible dots and dashes.

In 1848, Royal E. House of Vermont patented a piano-style keyboard and used compressed air to activate the mechanism that employed a type wheel and printed on tape.

In 1874, a Frenchman called Emil Baudot worked out a system of printing telegraphy using a five-unit selecting code. It is still in use, as the Baudot code.

In 1902, Joy Morton, head of the Morton Salt interests, and a friend - Charles L. Krum, a distinguished mechanical engineer - finally developed the first working model under the title of the Teletype Co. The printing portion was a modified Oliver typewriter mounted on a desk with the necessary relays, contacts, magnets and interconnecting wires. After a trial on the wires of the Chicago and Alton Railroad between Chicago and Bloomington, a span of about 150 miles, an attempt was made to develop a small, neat, direct keyboard typewheel printer. Western Union was handling a part of its traffic with a system called the Barclay, and there were many other systems in use.

The most serious problem was maintaining synchronization between the sending machine and the remote printer. If the distant unit was "off" or out of synchronization with the sending unit, it would receive the signals in improper sequence and print gibberish. It had to be resolved before the printing telegraph could make any headway in the communications world.

The printing telegraph of today operates on a circuit which is, in effect, a series loop. This means that all the machines are in series with each other, as in the key-type telegraph circuit. Resistance is added or removed to make the closed circuit current about 60 mils. The usual potential is about 100 volts DC, and since that of teletype equipment is of low resistance, we can consider it a constant current system in the 'closed' or 'mark' condition. The open line condition is called the 'space' or 'spacing condition'. This nomenclature dates back to the early days of the Morse telegraph system. Ink pen type equipment 'marked' the dots and dashes on a moving tape; the closed line operated the relay coil to bring the pen down on the tape (marking), and the open line released it between the dit and dah (space). Howard Krum's idea for keeping sending and receiving machines together was to add a 'start' pulse before each code combination and a 'stop' pulse after each code combination. This provided a fresh start and a correction period for each character, and made it simple to keep the receiving and sending machines in step for the fraction of a second required to transmit a character code combination. Thus full synchronization was achieved. (VE3AYL, CARTG)

BAUDS vs BITS PER SECOND

Two terms in common use in RTTY specifying speed are the Baud and BPS (Bits per Second). In amateur circles these two terms usually equate - 45.45 baud is the same as 45.45 bps.

Now that speeds are getting higher and higher, it is necessary to look at these terms more closely, as they can sometimes have quite different meanings. The baud is the unit of signaling speeds, i.e., it is effectively the number of mark/space elements contained in the transmitted radio signal in one second. With ordinary low-speed terminal units and modems, each data bit from the computer or teleprinter is encoded into one mark or space element. Therefore, baud equals bps.

With high-speed modems, the incoming bit stream from the computer is encoded in such a way that each transmitted bit can represent more than one data bit. By using phase modulation in the modem, the phase of the transmitted signal can vary according to the state of a pair of consecutive data bits. So a single transmitted element having a phase of 45 degrees could represent the two bits '00', 135 degrees represents '01', 225 degrees represents '10', and 315 degrees represents '11'.

We can send a bit stream from the computer to the modem at 2400 bits per second, but the modem converts each pair of data bits into a single element, and transmits each of these elements at 1200 baud. In this case the data rate (2400 bps) does not equate to the signaling rate (1200 baud).

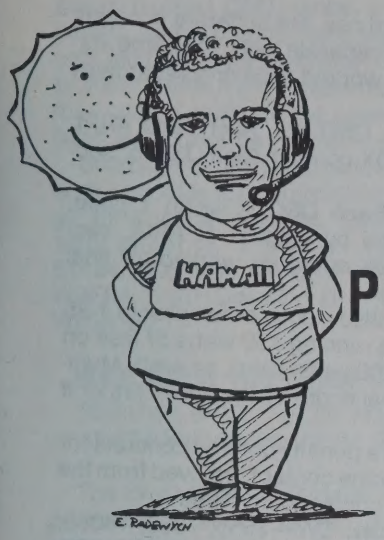
(BARTG DATACOM)

CHINA ON RTTY

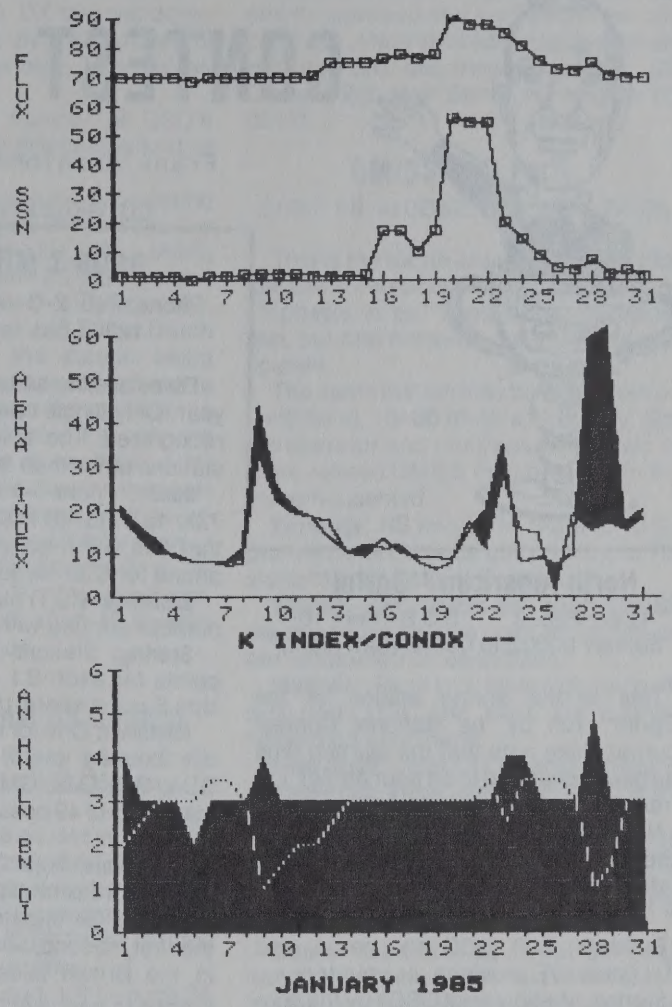
Back in August, the DX world shook with the appearance of China on RTTY. On the morning of August 18, the word came through that BY5RA was being worked by I8AA and several other European stations, who became a series of bytes suitably arranged on disk to whet the appetite of even the most casual DXer. W1DA accomplished what everyone was hoping to do. On September 7, 1057Z, on 14,080, was possibly the first USA ham to do the same thing. IOAOF, Joe, had contact with BY5RA on August 17 and understood that the operation was from Fuzhou City, the Peoples Republic of China, conducted by a group of Japanese operators to celebrate the 35th Anniversary of the Liberation of Fuzhou. The operator's name was given as Lin and the QTH as PO Box 730, Fuzhou, P.R.C. It is understood that Chinese operators have subsequently taken over the RTTY operation. Many DXers are patiently awaiting a chance to work this one.

AMTOR GAINING ACCEPTANCE

It is predicted that eventually the majority of hf amateur RTTY communications will be on Amtor. It offers the potential for error-free exchange of non-copyrighted computer programs on the h.f. bands under conditions never before believed possible. Additionally, mailbox operation on Amtor enables the sending station to know instantly that the message is being received properly. There are some European Amtor stations operating unattended under computer control, providing bulletin-board service that is vastly superior to the ASCII or Baudot systems. Peter Martinez, G3PLX, is credited for his efforts in making Amtor a reality. He adapted CCIR 476.2 (SITOR) specifications to a compatible mode for amateur radio and developed the first hardware systems to prove this adaptation. (CARTG)



KH6BZF PROPAGATION REPORT



Statistical information is compiled by KH6BZF and processed on a computer by VE3BMV.

The first diagram shows the value of solar flux (top curve) and SSN - sunspot number (bottom curve). The X axis and scale is the same for both. The Y - axis is calibrated in days of the month.

The second diagram shows variation of the Alpha Index for each day. The dark shaded area shows increases, while the white area shows decreases in the value of the Alpha Index for each day.

The third diagram shows the value of the K Index (shaded area) on a scale from 0 to 6. The dotted line represents the propagation quality where the scale is: from 5 = Above Normal to 1 = Disturbed.

FORECAST:

BEST HF CONDX: FEB.10-18, 27, MAR.1-3, 10-16, 18
BEST VHF CONDX: FEB.4-9, 19-26, MAR.2-7, 16-26

JAN '85	CONDX	SOL FLUX LEVEL	SSN#	GEOMAGNETIC LEVEL	ALPHA INDEX	K INDX	NOTES
01	BN	070 VY LOW	(001)	ACTIVE-M.S.LVLS	19/21	#K=4	Stormy periods
02	LN-BN	070 VY LOW	(001)	ACTIVE-ISO M.S.LVLS	14/16	#K=3	Isolated Storms
03	LN	070 VY LOW	(001)	UNSETTLED	10/13	#K=3	
04	LN	070 VY LOW	(001)	UNSETTLED	10/09	#K=3	
05	LN	069 VY LOW	(000)	QUIET-UNSETTLED	08/08	#K=2	Best HF this week
06	LN-HN	070 VY LOW	(001)	QUIET-UNSETTLED	08/08	#K=3	New spot N7-W18
07	HN-LN	070 VY LOW	(001)	UNSETTLED-ACTIVE	07/08	#K=3	New RGN 4613
08	LN	070 VY LOW	(002)	UNSETTLED-M.S.	08/11	#K=3	RGN 4613 Storm
09	DIS	070 VY LOW	(002)	MINOR STORM	33/44	#K=4	K=5 @ 0300-1800 UTC
10	BN-DIS	070 VY LOW	(002)	M.S.-ACTIVE	22/25	#K=3	
11	BN	070 VY LOW	(002)	M.S.-ACTIVE	19/20	#K=3	
12	BN	071 VY LOW	(001)	ACTIVE	18/18	#K=3	
13	BN-LN	075 VY LOW	(001)	ACTIVE	17/13	#K=3	BETA Conf on Disk
14	LN	075 VY LOW	(001)	UNSETTLED	10/10	#K=3	10.7 cm Solar Flux
15	LN	075 VY LOW	(002)	UNSETTLED	09/12	#K=3	Kicked up as a result
16	LN	077 VY LOW	(017)	UNSETTLED-ACTIVE	13/11	#K=3	Activity RGN 4616
17	LN	078 VY LOW	(017)	QUIET-UNSETTLED	10/12	#K=3	
18	LN	077 VY LOW	(010)	QUIET-UNSETTLED	09/08	#K=3	
19	LN	078 VY LOW	(017)	QUIET-UNSETTLED	09/06	#K=3	RGN 4617 Activity
20	LN	091 VYL-MOD	(056)	UNSETTLED-ACTIVE	08/08	#K=3	M1/1B @ 20/1904 UTC
21	LN	088 MOD-HI	(054)	UNSETTLED ACTIVE	17/15	#K=3	#K=5 @ 0300-0600 UTC
22	LN-HN	088 HIGH	(054)	UNSETTLED-ACTIVE	11/	#K=3	X4/2B @ 22/0004 UTC
23	LN-BN	085 MOD	(020)	ACTIVE-M.S.	28/35	#K=4	
24	LN-HN	081 MOD	(014)	M.S.-ACTIVE	15/08	#K=4	
25	LN-HN	076 VY LOW	(008)	ACTIVE-UNSETTLED	14/09	#K=3	
26	LN-HN	073 VY LOW	(004)	UNSETTLED-ACTIVE	01/07	#K=3	
27	LN	072 VY LOW	(003)	UNSETTLED	19/10	#K=3	
28	DIS	075 VY LOW	(007)	UNSETTLED-MAJOR STORM	15/60	#K=05	
29	DIS-LN	071 VY LOW	(002)	MAJOR STORM-ACTIVE	17/62	#K=3	
30	LN	070 VY LOW	(003)	ACTIVE-UNSETTLED	15/17	#K=3	
31	LN	070 VY LOW	(001)	UNSETTLED-ACTIVE	18/20	#K=3	

CONTEST RULES

Frank Anzalone, W1WY

CQ Magazine

North American "Sprint"

C.W.: Feb. 3 S.S.B.: Feb. 10
Sunday 0000Z to 0359Z (Sat. night)

This is the spring edition of the "Sprint" run by the National Contest Journal. Take note that the starting time has been advanced to an hour earlier, but it remains as a 4 hour "Sprint."

North Americans will be contacting other North American stations as well as stations in other countries, single operator only.

Exchange: Call, QSO no., name, and QTH (state, VE province, or country).

Scoring: Multiply total QSOs by the sum of states, VE provinces, and other North American countries worked for your final score (U.S. and VE not countries; KH6 not a state). There are 3 VE provinces, Maritime and VE2 through VE8.

Frequencies: Three bands only, 3530–3550, 7030–7050, 14030–14050 kHz on c.w., and 3870-3910, 7210–7240, 14260–14290 kHz on s.s.b.

Awards: A trophy to the highest scoring station on each mode. Certificates to the top station in each USA call district, Canada, and other countries. The top 10 scorers, the winning team, and each member of the winning team will also be rewarded.

Team competition is limited to a maximum of 10 operators as a single unit. Precontest registration is required for each team at least 24 hours before the start of the "Sprint." W6OAT is the coordinator.

There are other detailed rules, a special QSY rule, etc. I suggest you write to W6OAT or K7GM if you do not have a copy of the National Contest Journal. Entries must be received no later than 30 days after the end of each "Sprint." The c.w. go to: Rusty Epps, W6OAT, 948-H Kiely Blvd., Santa Clara, CA 95051, and the s.s.b. to: Rick Niswander, K7GM, 1914 W. Cortez Circle, Chandler, AZ 85224.

RSGB 7 MHz Contest

Phone: Feb. 2–3 C.W.: Feb. 23–24
1200Z Sat. to 0900Z Sun.

Rules are the same as those used last year. Only single operator entries will be recognized. The following rules are for stations other than the British Isles.

Bands: Phone—7.04 to 7.10. C.W.—7.00 to 7.03. (B.I. stations please note that this will require split frequency on phone for U.S. stations.)

Exchange: RS(T) plus a three digit QSO number starting with 001.

Scoring: Stations in Europe score 5 points for each B.I. contact. Those outside Europe score 15 points per contact.

Multiplier: One for each different British Isle country prefix worked (G2, GC3, GD4, GI6, GJ8, GM3, GU5, GW8, etc.), maximum of 49 possible. No credit for GB prefix.

Final Score: Total QSO points times the country prefix multiplier worked.

Awards: Certificates will be awarded to the first, second, and third place winners in the British Isles, Europe, and non-Europe in each section of the contest.

Include a summary sheet showing the scoring and a list of the country prefixes worked, and the usual signed declaration that all rules and regulations have been observed.

There is also an s.w.l. section with the scoring same as above. Overseas listeners log B.I. stations only. Record the call as well as the serial number sent. The call sign of the station being worked may only be repeated once in every three contacts logged unless it's a new multiplier.

Unmarked duplicate contacts will be penalized at ten times the number claimed. Logs containing in excess of five unmarked duplicates will be automatically disqualified.

Phone entries must be received no later than April 1st; c.w. April 22nd. This year they go to: G3OZF, RSGB HF Contests Committee, "Mayerin," Churchway, Stone, Aylesbury, Bucks., England.

YL-OM Contest

Phone: Feb. 9–10 C.W.: Feb. 23–24
1800Z Sat. to 1800Z Sun.

It's the YL's working the OM's in this annual activity organized by the YLRL. All bands may be used, but cross-band contacts or contacts with stations on net frequencies do not count.

Phone and c.w. are separate contests and require separate logs. The same station may be worked once only regardless of band.

Exchange: QSO no., RS(T), and ARRL section or DX country. (See *QST* for sections list.)

Scoring: Each QSO is worth 1 point. Multiply total by number of ARRL sections and DX countries worked for final score.

There is also a power multiplier of 1.25 for stations running 150 watts or less on c.w., and 300 watts p.e.p. on s.s.b. Multiply your final score by the above factor if you qualify.

There is a penalty of three contacts for each duplicate contact removed from the log by the contest committee.

Frequencies: CW—3555, 7055, 14055, 21195, 28195. SSB—3955, 7255, 14295, 21395, 28595. Plus or minus 15 kHz.

Awards: First-place cups to both YL and OM winners in each contest. Second and third place winners will receive certificates. The top scorers in each U.S. and VE call district and each DX country will also receive certificates.

Logs must be mailed by March 15th and received no later than April 5th to be eligible. This year they go to: Marty Silver, NY4H, 3118 Eton Rd., Raleigh, NC 27608.

QCWA QSO Party

C.W.: Feb. 9–10 S.S.B.: March 9–10
0001Z Sat. to 2400Z Sun.

This is the 28th annual QSO Party for the Quarter Century Wireless Association. It's a fun party to renew old friendships and to meet new friends.

Rules are the same as those used last year with a few modifications. CW and SSB are separate activities and require separate log entries. The same member may be contacted on each band for QSO points, but the chapter and "AL" multiplier are counted once only.

Exchange: QSO number, name, chapter (name or number), and state. If no chapter affiliation use "at large," or "AL."

Points: One point for each QCWA member worked on each band.

Multiplier: Each new chapter and one "AL" contacted, counted once only.

Score: Total number of QSOs multiplied by the total number of chapters plus one "AL" contact worked (well over 150 at last count).

Frequencies: CW—3545, 7045, 14045, 21055, 28055. SSB—3915, 7245, 14295, 21365, 28615. Plus or minus 15 kHz. Also 160 meters and 6 and 2 meters simplex.

Awards: Plaques to the top scorer in each party. Party QSO's can be applied to the many QCWA awards. Make your request on the summary sheet of your entry.

The standard QCWA log forms have 20 contacts to the page. If you prepare your

own, have columns for the time in UTC, station worked, QSO number sent and received, name, chapter, and state. *(A column indicating the band and the multiplier the first time it is worked would be helpful. Using a separate log sheet for each band would also be helpful.—ed.)*

Submit your entry right after each party, but no later than March 25th. CW logs go to: Eugene Santoski, K9UTQ, 1220 18th Street S, Wisconsin Rapids, WI 54494. SSB logs go to: William Haase, W9FPA, 1101 Downing Dr., Waukesha, WI 53186.

West Coast 160 Meter Contest

SSB: Feb. 9–10 CW: Mar. 9–10
0000Z Saturday to 2359Z Sunday

The West Coast 160 Meter Bulletin is promoting a series of 160 meter contests, adding to the ever increasing number of top-band activities.

Only single operator stations are eligible. There are two classes, subscribers and non-subscribers, and five subclasses: QRP, 250 watts, 1 kw, 2 kw, and 3 kw, PEP (power output × 2 = PEP).

Exchange: RS(T) and QTH.

Scoring: 10 points per QSO. There is a penalty of three QSOs for each duplicate contact that has not been deducted from the score.

Multiplier: Each U.S state, VE province, and DX country worked.

Final Score: Total QSO points × (states + provinces + DX countries) worked.

Awards: Plaque to the overall winner in each class and certificates to the subclass winners in each U.S. state, VE province, and DX country.

A signed declaration indicating the PEP power used in requested. Reporting false power-rating claims means disqualification and being banned from participation for a period of three years.

Mailing deadline for SSB is March 31st and April 30th for CW entries. Logs go to: R. Koziomkowski, KA1SR, 5 Watson Drive, Portsmouth, RI 02871.

(The DX Window operating restriction was not mentioned. Hope this is only an oversight.—ed.)

Dutch "PACC" Contest

1200Z Sat. to 1200Z Sun., Feb. 9–10

It's the world working The Netherlands on all six bands, 1.8 through 29.7 MHz, in the band sections recommended for contest operation by the IARU. The same station may be worked on each band, but on one mode only, phone or c.w., for QSO and multiplier credit.

Categories: Single operator, multi-operator, and s.w.l.

Exchange: RS(T) plus a QSO number starting with 001. Dutch stations will add two letters to identify their province. There are 12 provinces: DR, FR, GD, GR, LB, NB, NH, OV, UT, YP, ZH, and ZL.

Scoring: Each QSO with a PA/PB/PI station counts one point. DX stations determine their multiplier by the number of provinces worked on each band (maximum of 72).

Final Score: Total number of QSO's times the number of provinces worked on each band.

Awards: Certificates to the top scoring station in each category in each country and call areas of JA, LU, PY, UA9/0, VE/VO, VK, W/K, ZL, and ZS. Also second and third place awards if returns justify.

S.w.l.'s must log the call of the Dutch station as well as the station being worked and both serial numbers. Scoring same as above. Indicate the multiplier in a separate column in your log only the first time it is worked on each band. Include a summary sheet showing the scoring, your name and address in block letters, and the usual signed declaration.

Mailing deadline is March 31st to: PACC Contest, Att: F. Th. Oosthoek, PA0INA, P.O. Box 499, 4600 AL Bergen Zoom, The Netherlands.

ARRL International DX Contest

C.W.: Feb. 16–17 Phone: March 2–3
0000Z Saturday to 2400Z Sunday

Rules are the same as last year. However, I strongly recommend that you study the announcement in the December issue of *QST* for more details. Also send a large s.a.s.e. (2 IRC's for DX) for sample log and entry forms.

All bands may be used, 1.8 through 28 MHz, but not 10 MHz. Aeronautical or maritime mobile stations cannot be worked for contest credit. Following is a brief outline.

Categories: Single operator, both single and all band. Multi-operator, one transmitter and two transmitters. Also multi-operator, multi-transmitter. Also QRP, all band only. Multi one and two transmitter stations must remain on a band at least 10 minutes once a contact is made. Multi-transmitter stations no limit, but only one signal per band.

Exchange: RS(T) and state or province for W/VE; RS(T) and power input for DX stations (three-digit number).

QSO points: W/VE stations earn three points for each DX contact. DX get three points for each W/VE contact.

Multiplier: Each DXCC country worked on each band for W/VE's. DX stations use US states (48) and VE districts VE1–8, plus VO for their multiplier (9). (Maximum multiplier of 57 per band.)

Final Score: Total QSO points times the sum of the multiplier from each band. Entries with 500 or more QSO's must include a QSO check sheet.

Awards: Certificates given in each category, in each country, and in each ARRL section, plus a wide selection of plaques. Also certificates to DX stations making over 500 QSO's.

Disqualification regulations will be strictly enforced and are listed in the official rules. Mailing deadline for all entries is March 3rd, and they go to: ARRL DX Contest, 225 Main Street, Newington, CT 06111.

OMISS QSO Party

2100Z Fri. to 0200Z Mon., Feb. 22–25

This is the fourth annual QSO party for the OM International Sideband Society. Emphasis is on membership participation, but nonmembers are invited to participate.

The same station may be contacted on each band, 10–80 meters, SSB only. Single operator and multi-operator if two or more related OMISS members are in the same household.

Exchange: RS and QTH. State for U.S., prov./terr. for Canada, and country for DX stations (including KH6 and KL7).

Scoring: Two points for each OMISS member worked, one point for nonmember, contacted on each band.

Multiplier: Each U.S. state (48), each VE prov./terr. (13), and each DX country worked on each band.

Final Score: Total QSO points times the multiplier on each band. Add sums from each band for final score.

Awards: Plaques to top-scoring OMISS member and nonmember. Certificates to OMISS member winners in each state, prov./terr., and DX country.

Use a separate log sheet for each band and include a summary sheet showing the scoring and other essential information. Members should include their OMISS number. The usual signed declaration is also requested.

Entries must be received no later than March 30th by the party chairman: Doris Francis, NI4U, 2406 Sycamore St., Catlettsburg, KY 41129.

YL ISSBers QSO Party

Phone: Feb. 23–24 C.W.: March 16–17
0001Z Saturday to 2359Z Sunday

Rules are quite lengthy. Therefore, I suggest you send an s.a.s.e. to K0RDJ for a detailed copy. The party is open to all, but the emphasis is on membership participation.

The same station may be contacted on each band for QSO points, but it counts once only as a multiplier. You are required to take two rest periods of 6 hours each during the 48-hour contest period.

Exchange: Name, RS(T), SSBers number, US state, VE province, country, and DX/WK partner (non-members send no number).

Categories: Single operator, DX/WK partners, and OM/YL teams.

Points: Three points for each member contacted on own continent, six points if on a different continent. Non-member QSO's count only one point.

Multiplier: Only member stations count as a multiplier. One for each of the following: both DX/WK partners worked, each OM/YL team worked, each US state, VE province, and DX country worked. Two when DX/WK partners work each other, and two if your d.c. power input is 250 watts or less. *(Should add up to quite a sizable score.—ed.)*

Frequencies: Use the General Class portions of the US bands for both phone and c.w. On 20 avoid the net frequencies on 14313, 14332, and 14336. Check 40 and 80 meters on the hour. V.h.f. and u.h.f. may also be used, but simplex only.

Awards: Special certificates to the overall winners in each category. Regular certificates to the winners in each US state, VE province, and DX country.

Logs should be set up as outlined in the "Exchange" section above. All entries must be received by June 1st. They go to: Rick and Minnie Connolly, KØRDJ and NAØV, Star Rt. #1, Crocker, MO 65452.

CQ WW 160 Meter S.S.B. Contest

2200Z Fri. to 1600Z Sun., Feb. 22–24

Just a reminder that our 160 Meter S.S.B. Contest will be coming up the last weekend of this month. Extensive coverage has been given to this event with complete rules appearing in the December 1984 issue. There are no changes from last year's new format.

Exchange: Signal report and QTH (no QSO serial number).

Scoring: Contacts with stations within own country count two points; with stations in other countries but the same continent, five points; with stations in other continents, ten points.

The multiplier remains the same: each US state (48), VE province (12), and DX country. (US and Canada are not country multipliers.)

It is strongly requested that the "DX Window," 1825–1830, be kept free from W/K and VE/VO activity. Work the DX split frequency. (KP4 and KV4 should also observe this request.)

Mailing deadline for last month's C.W. Contest is February 28th. This month's S.S.B. Contest's deadline is March 31st. Send them to: Don McClenon, N4IN, 3075 Florida Ave., Melbourne, FL 32901. Of course, you can always use the *CQ* address: 76 N. Broadway, Hicksville, NY 11801. (Please indicate c.w. or s.s.b. on the envelope.)

"73" RTTY Contest

0000Z to 2400Z Sun., Feb. 23

This is the fourth annual RTTY contest sponsored by *73 Magazine* and the *RTTY Journal*.

The same station may be worked once on each band. Single operator stations are limited to 16 hours of operation. Multi-operators may operate the full 24 hours. Off times must be at least 30 minutes each and must be indicated in your log.

Classes: Single operator and multi-operator, single transmitter. Single and all band, 10–80 meters.

Exchange: RST and state or province for the U.S. and Canada. Others RST and a consecutive QSO number.

Scoring: Five points for contacts with Ws and VEs; 10 points for all other contacts.

One (1) multiplier point for each U.S. state (48), VE prov./terr., and DX country worked on each band.

Final Score: Total QSO points times the sum of the multipliers from each band.

Awards: Will be issued in each class to the winners in each U.S. call area, VE prov./terr., and DX country (minimum of 25 QSOs to be eligible).

Disqualification: Omission of the required entry forms, taking credit for duplicate contacts in excess of 2% of the total, and other discrepancies will be deemed grounds for disqualification.

Use a separate log sheet for each band, a dupe and summary sheet, and a multiplier check sheet. Indicate equipment and power used.

Contestants are requested to send a large SASE for official forms and final results. Mailing deadline is April 16th to: RTTY World Contest, c/o The RTTY Journal, P.O. Box RY, Cardiff, CA 92007.

COMMONWEALTH CONTEST 1985

1. Date of contest From 1200 gmt on Saturday 9 March, 1985 to 1200 gmt Sunday 10 March, 1985.

2. Eligible entrants Members of the RSGB in the UK and all amateur operators licenced to operate within the British Commonwealth or British Mandated Territories. Entires from GB, aeronautical mobile or maritime mobile will not be accepted.

3. Contacts CW only in the 3.5, 7, 14, 21 and 28MHz bands. Contacts may be made with any station using a British Commonwealth callsign except those within the entrant's own call area. All entrants are requested to confine their operation to within the lower 30kHz of each band except when contacting novice stations that operate above 21,100 and 28,100MHz. A contact exchange consists of RST and serial number commencing at 001. Serial numbers from non-competing stations, when sent, must be recorded.

4. Scoring Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third contact with each Commonwealth call area. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU and GW) count as one call area.

5. Logs A separate log for each band must be submitted and to include gmt, callsign of station worked, RST/serial number sent, RST/serial number received and points claimed. Band totals must be added together and submitted on a separate cover sheet. Any unmarked duplicate contacts for which points have been claimed will be heavily penalized, and logs conatining in excess of five may be disqualified.

6. Entries Entries may be single or multi-band. Single band entries may show on separate sheets contacts made on other bands for checking purposes only. Each entry should consist of the separate band logs together with a cover sheet declaration stating that the rules of the contest and the terms of the entrant's licence have been observed.

7. Address for logs Logs should be sent to A. K. Gray, G4DJX, 44 Sherwood Avenue, St. Albans, Herts AL4 9PQ, England. Adjudication commences on 13 May, 1985 and any entries received after this date may not be accepted. Overseas entrants are advised to send their logs by airmail.

8. Awards To the winner the BERU Senior Rose Bowl; to the runner-up the BERU Junior Rose Bowl and to the leading UK station the Col. Thomas Rose Bowl. Certificates of merit will be awarded to first, second and third placings in home and overseas multi-band sections; the leading home and overseas single-band entries on each band and the leading station in each overseas call area.

Receiving Section

1. When Times and dates as transmitting section.

2. Entrants Members of the RSGB resident in the UK and all swls resident in the British Commonwealth or British Mandated Territories. Only the entrant may operate his receiving station for the contest. Holders of transmitting licences for frequencies below 30MHz are not eligible to take part.

3. Scoring To count for points, a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may logged only once on each band to count for points. When both stations are heard they should be logged separately and points claimed for both entries provided they are both outside of the entrant's own call area. Each completed entry shall score five points. In addition a bonus of 20 points may be claimed for the first, second and third station heard in each British Commonwealth call area. British Isles prefixes count as one call area.

4. Logs A separate log is required for each band. Logs should show time/gmt, callsign of station heard, RST/serial number sent by station heard, callsign of station worked and points claimed.

5. Entries Each entry should consist of logs for each band, a cover sheet and a signed declaration stating that the receiving station was operated within the rules and spirit of the contest and that the entrant does not hold a transmitting licence for frequencies below 30MHz.

6. Address for logs As in the transmitting section.

7. Awards The BERU Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

EMERGENCY TRAFFIC

CHUCK CLARK, K4ZN

MARITIME EMERGENCIES

The first use of wireless at the turn of the century was for point-to-point communication on land, but its most promising application was at sea. Eighty years later, this still holds true in the eyes of regulators, even though maritime radio currently represents one of the smaller fields in terms of dollars and cents. It's importance stems from the fact that radio communication has saved countless lives at sea and will continue to do so.

Amateur Radio has played its part in saving lives at sea, too, more than most of us realize. Hardly a month goes by without a distress call being handled by amateurs. Many commercial radio operators began as hams.

One incident comes to mind. A young man was sitting in a window of John Wannamaker's department store in New York, demonstrating the new-fangled wireless contraption on April 15, 1912, much as amateurs today give demonstrations in shopping malls, at fairs and conventions. On that fateful day the young man picked up the SOS and CQD (both were then used as distress calls) of the Titanic. For three days, the 21-year-old operator kept the people of the US posted on what was happening. The young man was David Sarnoff, soon to become America's Mr. Radio. True, it was in broadcasting that he was to make his fortune, but RCA continued to play a leading role in maritime radio communications. The company is still involved in this field, although maritime radio doesn't represent a significant amount of the company's business today.

OPTIONS AVAILABLE

Boaters have several options as to the radio equipment they carry. There are the many aids to navigation, radar, loran, omega, satellite receivers and direction finders. Ordinary receivers, even TV sets should be taken into account. All of them can, in one way or another, contribute to maritime safety. None of them, except radar, need to be licensed on US vessels. Some other countries require licenses even for radio receivers. But this concerns only the boater, not the amateur ashore.

Transmitting options include:

1. Maritime Mobile Radiotelegraph.

This is the original maritime radio system, still very much alive today. Any vessel may install a radiotelegraph station. Anyone may carry emergency lifeboat transmitters without a license if these are used for genuine emergencies only. Of course, there is a need for an operator with a commercial radiotelegraph license, which is one reason why few, if any, private vessels carry maritime rediotelegraph stations.

2. SSB Maritime Radiotelephone.

This is the normal way smaller ocean-going vessels provide for their communication needs. Equipment is similar to amateur transceivers. Many manufacturers use the same basic design for both services, but such gear should be designed for shipboard use service with heavier demands than those encountered in an amateur's home station. Such equipment must be built with safety and reliability in mind. Aboard US vessels, single-sideband transmitters must be type-accepted by the FCC. All of this drives the cost up, as does the rule that any vessel that carries sideband equipment must also carry VHF FM gear.

3. VHF FM.

The normal means for communication for vessels operating on inland waterways or on the ocean near the coast is now VHF FM. Ships use these channels for contacts between ships, with lock and bridge tenders, with the Coast Guard, and with public coast stations which patch them into the landline telephone system. Equipment here is much like amateur two-meter gear. It is also required to be type accepted if used on US vessels, and costs somewhat more than amateur two-meter rigs.

4. Amateur Radio.

No provision is made, among any rules, for ships carrying amateur radio stations for maritime safety purposes. However more and more boaters have found that Amateur Radio offers one of the most effective and reliable means of communication available anywhere. Station licensing requirements are minimal, few restrictions are placed on equipment, and a wide range of frequencies are available. The one hurdle a boater must surmount is the requirement for a licensed operator. Sad to say, many boaters walk around this one instead of clearing it. One writer estimated that half the ocean-going yachts afloat carry amateur stations, and only half of these also carry a license. Athough this is a situation that needs correction, it does show that benefits of an amateur station aboard are generally appreciated by the boating public. Another regrettable fact is that some people who carry amateur transceivers modify them to operate on frequencies allocated to the maritime mobile service. It is not illegal to do this, at least not aboard a United States vessel, but it is illegal to use rigs thus modified except for distress communication.

5. Citizens Radio.

This is the lowest-cost radio for the average boater. Equipment is available anywhere, is simple to install and operate, and requires no license in the United States. However, range is limited, so it is quite possible that a station in an emergency situation could be out of range of anyone who could help. Some US Coast Guard stations, some State Highway Departments, and many REACT volunteers do monitor channel 9, so there are many areas where CB will provide all the communication one needs.

6. Satellite Communications.

Crystal gazers in the communications industry are predicting that maritime CW will be replaced for the most part by satellite communication by the year 2000, making it possible to work directly into the world's telephone and data communication system without an operator, just as one does ashore. Sparks won't be out of a job, however, as someone will have to be aboard ship to maintain the equipment in working order. Even now, his (or her) title is frequently "radio and electronics officer," It will take far longer than 15 years for small vessels to convert to satellite communications, because a terminal costs as much as a fair sized yacht, about $65,000.

DISTRESS PROCEDURES

The law says that any vessel in distress may use any means of communication available to call for help, on any frequency and with as much power as needed, without regard to interference caused to other communications. Distress communication has absolute priority over everything else. If you're the one in distress, you are free to do whatever is necessary to make your plight known, use any or all of the six options listed above. There are maritime calling frequencies, such as 500 kHz, 2182 kHz and 156.8 MHz, which are monitored by the Coast Guard and by ships everywhere. You can try CB channel 9 in the US. For Amateur Radio, there is 14,313 kHz, the frequency of the principal maritime mobile net and the one most likely to offer help. If that fails, or if you can't work that frequency, you can call anywhere. It's probably best to bread into a QSO between two stations with strong signal, or into a net which you can hear well.

The distress call is SOS on CW (with no spacing between the letters), MAYDAY on voice. A distress call should include your call sign, the name description and position of the vessel, the number of persons on board, and specific help needed. The usual procedure is to send a distress call and a distress message at once. Stations receiving the calls answer afterwards. The station in distress is in control, acting as a net control station, but can and usually does delegate control to another station

with good signal strength, because the station in distress already has enough on it's hands. If the Coast Guard comes up on the frequency, it's the logical one to make net control, although it doesn't automatically have that authority.

The important thing for the operator in distress is to be sure that all important details are in the distress message, so that helpers will know what is needed and where and how to recognize the vessel in distress.

If you hear a distress call (most likely it will be on 20 meters, but it could be anywhere), the first thing to do is to acknowledge receipt, if you can transmit on a frequency that the station in distress can receive. Just call the station, give your call, and Roger the message. If you are taking any specific action, say so. Otherwise, add nothing. If you think other stations are probably better situated to assist, wait to allow them to acknowledge first. Keep a record of it all, as completely as possible. Try to get call signs of all stations involved, the complete text of the distress message and of other communications if possible, and keep everything as part of your station records.

Action you would take would include going to the distressed vessel yourself if you are aboard ship and near enough, calling the Coast Guard, or repeating the distress message if you decide that you can in that way secure additional help.

Calling the Coast Guard is your most probable choice. Identify yourself as an Amateur Radio operator, giving your name, address, call sign and telephone number, then give the complete distress message, frequency and mode by which you recieved it. Then do whatever the Coast Guard tells you to do. The whole thing may be a hoax, but treat it as a genuine distress, That's what the Coast Guard does. Of course, if anything seems suspicious, mention that too: "Signals seem to be coming form the northwest, but the position given is to the southeast," for example. The Coast Guard will still put its rescue operation into effect, but it will probably ask the FCC to have its monitor station locate the transmitter.

Sometimes you may decide that you could obtain more help by calling on another frequency. For example, if you are not able to help and you hear no other station acknowledge the call, you can make a distress call yourself. Your call then has the same priority that it would have if you were in distress. The distress call in this case, however, is MAYDAY RELAY on voice and DDD SOS DDD on CW. Give the distress message as you received it, and perhaps add the frequency being used by the station in distress.

Your part in a distress incident will more likely be to listen and keep quiet. If the situation is in hand, stay off the air. Don't even try to shut others up, unless the station controlling the traffic asks you to or unless it's clear that you're the best one to do it. In that case, just tell the offending station, SILENCE, MAYDAY, or QRT SOS on CW. Don't argue. If the interference persists, include that in your records, and maybe phone a monitoring station.

Distress incidents happen rarely in most amateurs' experience, but they can happen. It is a good thing to know what to do. Somebody's life, even yours, may depend on it. (K4ZN)

FCC NEWS

BILL GRENFELL, W4GF

THE COMMENT PERIOD ON THE RM-4831 PETITION FOR "REALLOCATION" OF 216-222MHz FOR NARROW BAND OPERATION BY "THE PRIVATE LAND MOBILE SERVICES" FILED SEVERAL MONTHS AGO BY SIDEBAND TECHNOLOGISTS, INC. (STI), FINALLY ENDED IN JANUARY 1985. Also before FCC for consideration is the RM-4829 Petition of the Land Mobile Communications Council which included a statement that "...the band 220-225 MHz may prove to be valuable for future land mobile operations." The Commission's decision on these petitions was not available at the time of writting. A copy of Senator Goldwater's letter asking FCC "...to keep hands off 220" was included in last month's FCC News.

THREE PETITIONS TO MODIFY THE CURRENT VEC PROCEFURES HAVE BEEN FILED WITH FCC BY THE SUNNYVALE ARC VEC AND GORDON GIRTON, W6NLG, SUNNYVALE, CA. Substantial revision of FCC's application Form 610, standardization of the bulletin 1035 Q. & A. pool, provision for more amateur participation in the make-up of the exam pool and a requirement that FCC provide correct answers and reference materials therefor, are some of the changes requested.

THE TWO DAY HEARING OF THE CASE OF JAMES W. SMITH, W6VCE, FOR FAILURE TO IDENTIFY (97.123), BROADCASTING (97.113), TRANSMITTING MUSIC (97.115), AND INTERFERING (97.125) WAS CONCLUDED ON DECEMBER 6, 1984. The decision was not available at the time of writing.

THE FCC ACTION AMENDING THE CABLE LEAKAGE MONITORING AND RESTRICTION RULES, REPORTED IN LAST MONTH'S FCC NEWS, WAS THE SECOND REPORT AND ORDER IN DOCKET NO. 21006, released November 9, 1984.

FCC HAS BEEN PETITIONED TO AMEND ITS RULES "...TO PERMIT RADIO OPERATORS TO OFFICIALLY FUNCTION IN THE COORDINATING AND LICENSING OF REPEATER STATIONS IN THE FREQUENCIES ABOVE 29.5 MHz." The petition was filed by former member of ARL/QST staff (League Lines, etc.) Peter O'Dell, KB1N. O'Dell asks that "the Commission, taking whatever steps it deems appropriate, appoint one national organization to develop a consistent, fair, program of spectrum management for amateur repeater stations operating above 29.5 MHz....The Commission would then issue these stations licenses. Repeater operation without the special license would be prohibited." O'Dell stated that he is not officially affiliated with any major Amateur Radio organization or frequency coordination body. (From December 20, 1984 ARRL Letter). I have been advised that FCC is very concerned about the growing number of repeater conflicts that they are asked to resolve, which amateurs are not able to resolve themselves. I understand that the FCC was already engaged in developing procedures to cover the same problem at the time the O'Dell petition was received.

A "PETITION FOR REVIEW AND CLARIFICATION OF PART 97 OF THE COMMISSION'S RULES TO PROVIDE A CAVEAT SO THAT NON-CITIZEN LICENSEES ARE NOTIFIED UNDER (SECTION) 97.95... THAT THE USE OF THEIR U.S. CALL SIGN IN OTHER COUNTRIES IS IN VIOLATION OF THE CONDITIONS OF GRANT" WAS DENIED BY FCC on November 27, 1984. The petition was filed by Herbert Schoenbohm, KV4FZ. In their Memorandum Opinion and Order, FCC quoted Schoenbohm: "...there has been an ever increasing amount of foreign nationals who have...a United States license...used to engage in third party phone patch communication from outside the United States." This fact is especially evident in foreign yachtsmen on non-United States vessels who claim to be on the high seas using the US call country. "Much of this operation does in fact take place from foriegn water..." The FCC stated in part: "The holder of an amateur license issued by the Commission, whether a U.S. citizen or not, is subject to international law. An alien amateur licensee on a non-U.S. or U.S. vessel in the territorial waters of a foreign nation is subject to the laws of that nation." That he holds an amateur license isssued by the Commission is irrelevant, except in the case of a US vessel where it is required. "... distance never affects our jurisdiction over the licensee, which as explained above, runs concurrently with that of the foreign country when the licensee is within its boundaries...Thus, no additional rules are needed to regulate our amateur licensees who are using their radios overseas."

BY JANUARY 1, 1985, OVER 1,200 COMMENTS WERE FILED, MOSTLY IN SUPPORT OF THE PRB-1 "MATTER OF REQUEST FOR DECLARATORY RULING TO PREEMPT STATE AND LOCAL REGULATION OF AMATEUR RADIO TRANSMITTERS AND ANTENNAS." Among those supporting PRB-1 are a number of City and County emergency and disaster departments as well as many individuals. The American Red Cross has filed supporting comments and, as this was written, the ARRL understood that the

Department of Defense or its Defense Communications Agency (DCA) would be filing in support of the concept of PRB-1. The National League of Cities (NLC) has filed opposing comments. NLC states, in part, that "the Petitioner must do more than assert that local regulations which affect the installation of radio amateur antennae frustrate national communications objectives." See QST, January 1985, pages 48-49 for more details about the NLC filing.

THE RM-4872 PETITION FOR TELEPHONY PRIVILEGES BELOW 7100 kHz FOR US AMATEUR LICENSEES IN PUERTO RICO, REPORTED IN LAST MONTH'S FCC NEWS WAS SPECIFICALLY FOR 7075-7100 kHz and included other US Caribbean territories. It was filed by David Novoa, KP4AM, who stated that use of this segment would facilitate contact with South American amateurs, and cited the "local unique situation" that Puerto Rico and tha Caribbean territories are the only US possessions not allowed to use phone in this segment. (From ARRL Letter, December 6, 1984). The comment period ended 01/08/85.

THE ARRL PETITION FOR USE OF F2 EMISSION IN THE 28 MHz BAND FOR REPEATER IDENTIFICATION, REPORTED IN LAST MONTH'S FCC NEWS HAS BEEN DESIGNATED AS RM-4880.

THE ARRL AND AMSAT HAVE FILED A JOINT PETITION WITH THE FCC ASKING FOR AMENDMENT OF PART 97 TO BRING THE LIST OF FREQUENCIES ALLOCATED TO THE AMATEUR SATELLITE SERVICE INTO LINE WITH THE NEW ALLOCATIONS MADE AT THE WARC '79. (From ARRL Letter, December 6,1984). FCC advises preparation has been under way to issue a Second Notice implementing the WARC allocations. However, it will be identified by a different Docket number than the previous WARC rule making proceeding.

ARRL MAY SEEK "FURTHER CLARIFICATION" OF CHANGES OF THE WARC EMISSION DESIGNATORS MADE EFFECTIVE FOR AMATEURS BY FCC ON JANUARY 3, 1985. (From ARRL Letter December 6,1984). See last month's FCC News for a list of the old vs. the new designators.

THE FCC HAS RECEIVED A PETITION ASKING AMENDMENT OF PART 97 TO PERMIT ONLY A1 BETWEEN 144.0 AND 144.1 MHz, AND A1, A2 AND A3 ONLY BETWEEN 144.1 AND 144.3 MHz. Petitioner Charles Reichert, KD9JQ, indicates this has a "gentleman's agreement" plan and gives reasons why he beleives it should be made formal by incorporation in the FCC's Amateur rules.

RM-4879 HAS BEEN ASSIGNED BY FCC TO DESIGNATE THE ARRL'S PETITION TO ALLOW AUTOMATIC CONTROL OF DIGITAL COMMUNICATION ABOVE 30 MHz. "This... would permit the operation of Computer-Based Message Systems (CBMS) on the amateur VHF bands under automatic control. "Present FCC Rules require that a control operator be present for CBMS operation." See last month's FCC News and QST, January, 1985, page 49 for more details. Preparation of the Commission's action on the petition was under way early in January, 1985.

ON DECEMBER 6, 1984 FCC RELEASED A "HOUSECLEANING" TYPE EDITORIAL ORDER AMENDING THE AMATEUR RULES, PART 97, TO DELETE OBSOLETE TERMS AND REFERENCES, AND TO MAKE OBVIOUS CORRECTIONS AND EDITORIAL IMPROVEMENTS. An example of the obsolete is a reference in current rule section 97.5, a listing of Classes of operators licenses, to "Advanced class (previously Class A)." That rule wording became effective in the Commission's Docket 9295 on March 1, 1951! Soon thereafter, issuance of new Class A's ceased and renewals were issued as Advanced Class. Full details of the 12/06/84 Order will appear in QST according to the 12/20/84 ARRL Letter.

ON JANUARY 1, 1985, THE MAXIMUM ALLOWABLE REIMBURSEMENT FOR OUT-OF-POCKET COSTS FOR VOLUNTEERS ADMINISTERING AN AMATREUR RADIO OPERATOR LICENSE EXAMINATION BECAME $4.16. This is based on the 4 percent rise in the Department of Labor Consumer Price Index for the year ending September 1984. "ARRL General Manager Dave Sumner, K1ZZ, has already told the FCC that the fee charged by the League, a 13-area VEC, will remain at $4.00 throughout 1985." (From ARRL Letter, December 20,1984).

THE LATEST VERSION OF FCC'S PR BULLETIN 1035 "STUDY GUIDE FOR FCC AMATEUR RADIO OPERATOR LICENSE EXAMINATIONS" IS DATED DECEMBER 1984. Copies of this syllabus can be obtained form ARRL Headquarters. FCC forms may be obtained by addressing a request specifying the Form or Bulletin number to "FCC, Washington, D.C., 20554."

FCC ACTION ON THE PETITIONS FOR REDUCTION OF THE 30-DAY WAIT TIME FOR RETAKING AN AMATEUR LICENSE EXAM AFTER A FAILURE WAS EXPECTED IN MID JANUARY, 1985. As reported in last month's FCC News, ARRL (RM-4835) asked for 27 days and another petitioner asked for 7.

ON JANUARY 3, 1985 SENATOR BARRY GOLDWATER, K7UGA, INTRODUCED INTO THE 99TH CONGRESS RESOLUTIONS WHICH WILL URGE FCC TO MAKE SURE THAT ZONING LAWS AND SIMILAR LOCAL ORDINANACES ARE NOT USED TO FRUSTRATE CITIZEN ACCESS TO SATELLITE SUPPLIED SERVICES (SR-35), OR TO PREVENT EFFECTIVE AMATEUR RADIO COMMUNICATION (SR-36). The senator also introduced a bill, S-66, dealing with malicious interference to radio communications. (W4GF)

CLASSIFIED ADS CONTD.

WANTED DRAKE MN-2700 or equivalent. Must handle legal limit and include 160 and 10 m. Also want commercial linear using pair of 3-500Z. Must have 160 and 10 m. John Zwaska, W4WKQ, 37 Longwood Dr., Shalimar, FL 32579. (904) 651-1607

YAESU FT 901DM with FM, memory, keyer, DC supply, FT cascaded SSB Filters, FT 500 CW filter, great DX-Contest machine, $ 525. FT-707 monile rig, worked 70 countries in 4 months, includes mobile mount, $ 395. U-ship. Tom, KT6V, (619) 464-6465

COLLINS 75S3A 250 Hz, 1.5, 2.1, 4 kHz filters, 32S-1, speech processor, 516F-2; extra crystals, $700. &%a$, 500 Hz, 3.1, 6 kHz. Johnson Valiant; Johnson T/R switch, $350. Heath SB-200, 10-80 m, $300. All have manuals. U-ship.
WANTED 3 el. 40 m Yagi. K4JLD, 7 Long Lane, RD 2, Hummelstown, PA 17036. (717) 566-6098

VE3BMV IN CQ WPX will be operating on 80 meters monoband, say hello and please help with a point and multiplier. TNX!

CLASSIFIED ADS

The Classified Ads rate is 15 cents per word. Remittance in full (check or money order) must accompany copy. Each word, abbreviation, model number, and group of numbers count as one word. No charge for Postal or ZIP code. Ads should be typed or clearly printed on a separate piece of paper. The closing date is the 25th of the month preceding publication. A last name or call must appear in each ad with an address or phone number.

Hamfests and Convention ads are free of charge.

New subscribers to RADIOSPORTING are entitled to one free ad.

ORLANDO HAMFEST IS COMING UP on March 9-10, 1985. Plan to attend, next door to Disney World, great program, Contest and DX forums, over 10,000 expected to attend. Be there!

DX QSL SERVICE. QSL's sent to DX stations & managers. SASE for details. N7RO, 2935 Plymouth Dr., Bellingham, WA 98225

KENWOOD TS-520 with remote VFO-520. Perfect condition, for sale by first owner. Nice contest upgrades included (front-end, attenuator, etc) for $485, including shipping. SASE for fuller description. Fred Hopengarten, K1VR, Willarch Road, Lincoln, MA 01773, (617) 259-0088, Off: (617) 899-1025

WANTED TOWER URGENT - Heavy Duty Sampson tower sections with diagonal bracing. 10' sections, 1 1/2" tubular steel, 14 1/2" centres. Andy, VE7AHA, 4551 Arthur Dr. Delta, B.C. V4K 2X4, (604) 946-7420

CONTEST FORMS FOR CQ WW, CQ WPX AND CAN-AM CONTESTS. Each set includes summary sheet, multiplier check sheet, dupe sheets for Europe, VE/W and rest of the world, log sheets with 100 QSOs per page as described in RADIOSPORTING Dec.84. Send business size SAE and $1 per set to: IRSA, Box 65, Don Mills, ON M3C 2R6

YAESU FL-2100B 1.2 kW Amplifier, 80-10 m, Excellent condition, $300. Ken Claerbout, KE9A, Rt.1, Box 16, Remington, VA 22734, (703) 439-8750

TRETINA PRINTING, INC.
Hwy. 36, Airport Plz.
Hazlet, N.J. 07730 U.S.A.

BULK RATE
U.S. Postage
PAID
Permit No. 101
HAZLET, N.J.

K3ZO S8510
Fred Laun III

Box 31097
Temple Hills, MD 20748

IN THIS ISSUE

VE3BMV Radiotorial	5	DX spotting repeaters, WA6ITF	25
DX News	6	The next Shuttle and Ham, WA6ITF	27
QSL Information	7	ARRL CAC, VE3KZ	28
DXpeditioning, WB4ZNH	8	CAN-AM Scores, VE3IY	28
Here's the beef, NØ/FØOL	9	Tech News, VE3JTQ	29
W2PV on antennas, Part 3	11	Awards - WAZ, VE3JTQ	30
Listening on 160, K1VR	15	RTTY, VE3AYL	32
Kenwood TS-930S, VE3BMV	17	Propagation Report, KH6BZF	33
International Goodwill, WA2KCL	19	Contest Rules, W1WY	34
Modifications for TS-930S, VE3AZ	20	Emergency, Traffic, K4ZN	37
Third order IMI, KB9I	22	FCC News	38
Going all out, AD8J/3	23	Classified Ads	39

INTERNATIONAL RADIOSPORT ASSN.

P.C. Box 65, Don Mills, Ontario, Canada M3C 2R6 Tel. (416) 438-6313

Purpose and objectives:

1. To promote international friendship and goodwill through sportsmanship, radio contesting and DXing.

2. To improve the quality of amateur radio operators and operating through education and experience, by voicing the opinions of radio amateurs that are experienced and have contributed to the hobby.

3. To promote amateur radio contesting and other operating-related activities as a sport, and to provide the publicity and recognition that it deserves in the public media.

4. To publish timely articles in the monthly magazine "RADIOSPORTING" on various subjects of interest to Contesters, DXers, SWL, VHF, UHF and microwave enthusiasts, on RTTY, SSTV, computers in communications, fox hunting and anything of interest to the active ham striving for self-improvement. To feature technical articles on equipment design and modifications, antenna construction, radio-wave propagation, and commercial equipment reviews by qualified people.

5. To organize, as an annual event, the "International Contest Symposium," which runs parallel (evenings) with the Dayton Hamvention; to feature timely topics with the participation of some of the world's leading amateurs at the Syposium.

6. To hold an annual Awards Dinner with an entertainment program, where awards for various achievements will be presented.

7. To maintain and publish all time record tables for significant contests.

8. To sponsor and run an annual World Contest Championship, based on results of a number of major contests, with annual the "Contester of the Year" awards in various categories.

9. To administer the "Contest Hall of Fame" and vote on awarding membership to those who have significantly contributed to the sport of contesting.

10. To coordinate and assist in the scheduling of international contests.

11. To hold regular weekly meetings on air on 20 and 80 m. (14.200, 3.830)

12. To provide an automatic, computer controlled bulletin station that transmits the latest DX and Contest news on CW and RTTY.(14.098)

13. All in all, the IRSA is dedicated to the pursuit of excellence and quality in amateur radio by promoting, publicizing and leading the way.

14. Attractive numbered membership certificates and badges are issued to members.

15. IRSA is run by contesters who are selected for their accomplishments and it is independent of any national or commercial organizations.

16. IRSA will assist and sponsor Contests/DXpeditions, Trophies and other radio sporting and publicity events.

17. IRSA is a non profit organization, with all proceeds to be used to finance events and awards sponsored by IRSA and to cover expenses incured by Association.

18. IRSA members can display the IRSA logo on their QSL cards and correspondence; members agree to obey the Contester's Code of Ethics and to promote it.

The initial fee to join the IRSA is US $12; it includes the cost of a certificate and a badge. The yearly membership dues are US $5. (Or 24 and 10 IRCs resp.)

Honorary Life Membership will be awarded to those who significantly contribute to IRSA and the sport of contesting.

Members are entitled to be elected and to elect officers of IRSA. They will also enjoy many services and privileges offered exclusively to members.

RADIOSPORTING

INTERNATIONAL MONTHLY MAGAZINE -
BY AND FOR ACTIVE RADIOAMATEURS

Editor Yuri Blanarovich, VE3BMV

Contributing staff:

Propagation	Lee Wical, KH6BZF
Contest Rules	Frank Anzalone, W1WY
Emergency/Traffic	Chuck Clark, K4ZN
Technical	Dave Ingram, K4TWJ
FCC News	Bill Grenfell, W4GF
Awards, Tech News	Mike Spenuk, VE3JTQ
DXpeditioning	Carl Henson, WB4ZNH
YL	Cathy Hrischenko, VE3GJH
Europe	Jiri Kral, OK2RZ
	Erik Sjolund, SMØAGD
Asia	Tack Kumagai, JE1CKA
Pacific	Ron Wright, ZL1AMO
Africa	Sam Ford, ZS6BRZ
Canada	Bob Nash, VE3KZ
USA	Terry Baxter, N6CW
Photo production	Richard Staron, VE3FAC
Advertising, productn.	Sonya Blanarovich
Cartoonist	Eugene Radewych

Editorial offices: RADIOSPORTING
Box 65, Don Mills
ON, Canada, M3C 2R6
Telephone - (416) 438-6313 (24 hrs)

===== Copyright 1985 RADIOSPORTING =====

PUBLISHED BY: TRETINA PRINTING INC.
Hwy. 36, Airport Plaza
Hazlet, N.J. 07730 U.S.A.

PRINTED IN USA

IRSA Officers:

President	Yuri Blanarovich, VE3BMV
Directors	Terry Baxter, N6CW
	Frank Brooker, 9Y4VU
	Sam Ford, ZS6BRZ
	Dave Goodwin-Hill, VE2ZP
	Ladislav Holanda, DK3SN
	Jiri Kral, OK2RZ
	Tack Kumagai, JE1CKA
	Andy McLellan, VE1ASJ
	Ron Morefield, W8ILC
	Bob Nash, VE3KZ
	Jim Roberts, VE3IY
	Martin Rosenthal, VE3MR
	Mike Spenuk, VE3JTQ